This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

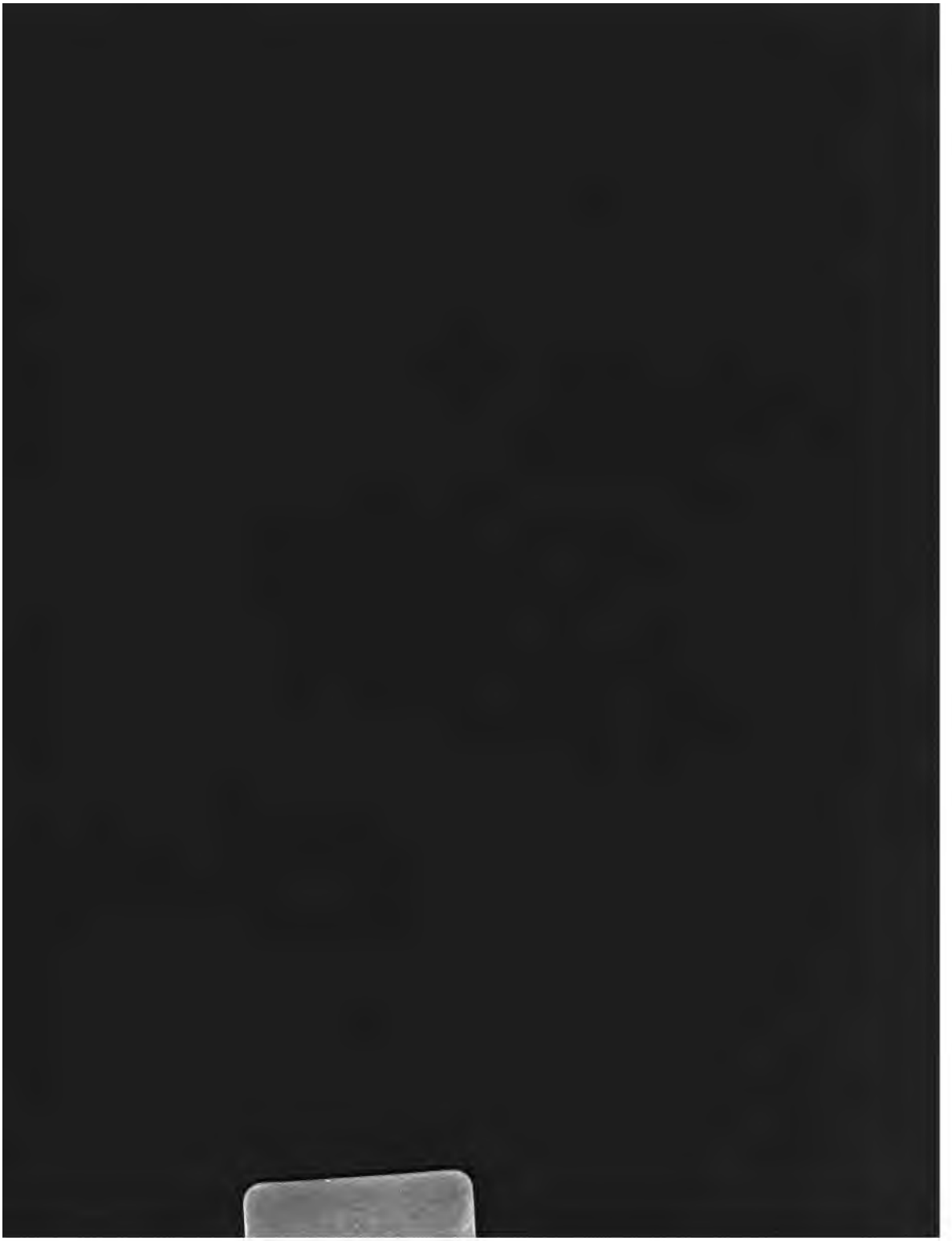
+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

THE
SCHOLAR



Per. 3985 d. 17/1

THE SCHOLAR:

A Monthly Educational Paper for School and Hon

Conducted by JOSEPH HUGHES.

'Try Again.'

VOLUME I.

MARCH to OCTOBER, 1882.

BODLEIAN LIBRARY
26OCT83
OXFORD.

LONDON:
JOSEPH HUGHES, PILGRIM STREET, LUDGATE HILL.
1882.

CONTENTS.

Algebra. By W. H. Harvey, B.A. (London), 8, 21, 31, 41, 53, 66, 77, 89.
Arithmetic for Standards III., IV, V, VI., and VII. By William Spencer, 6, 19, 33, 44, 57, 70, 81, 92.
Answers to Algebra, 97.
Answers to Arithmetic, 98.

Dictionary, 12, 29, 47, 56, 69, 79, 96.
Domestic Economy Lessons, The Pith of a Course of. By Mrs. Wigley, 10, 23, 35, 46, 59, 68, 80, 87

Editor's Note, 96.

Freehand Drawing Copies, 9, 22, 32, 42, 54, 65, 83. 91.

Gems from the Poets, with Portraits, and Lives by J. S. Fletcher.
William Shakspere :—The Seven Ages of Man —Antony's Address to the Romans, 3.
John Milton :—Evening in Paradise—from the Nativity Hymn, 15—Hymn to Light, 4.
Henry Wadsworth Longfellow :—Flowers—The Wreck of the *Hesperus*, 27.
William Wordsworth :—To the Cuckoo—Alice Fell ; or, Poverty, 39.
Oliver Goldsmith:—The Hermit, 51.
Lord Byron :—Evening before the Battle—Sunset in Italy, 63.
Percy Bysshe Shelley :—Ode to the West Wind, 75.
William Cowper :—Verses supposed to have been written by Alexander Selkirk—Loss of the *Royal George*, 85.

Money Prize Competition, The Scholar's, 12.
" " " " List of Prize Winners, 56.

Prospectus of Volume II., 96.

School Songs in both Notations. By Crampton :—
Come, Gentle Spring, 11.
The Travelling Tinker, 24
The Council of the Mice, 36.
Make Hay while the Sun Shines, 48.
The Squirrel, 60.
Lightly Go! 72.
Going a-Blackberrying, 84.
Nutting Song, 94.

Selection from the Press :—
Weights and Measures—*The Globe*, 95

Stories from English History. By the I G. W. Cox, Bart., M.A., with original tions by Gunston :—
I. The Fight at Senlac, 1.
II. Coronation of the Conqueror, 13.
III. Richard II. and the Men of Ken
IV. The Exploits of Richard th Hearted, 37.
V. Edward the First and William 49.
VI. The Death of the Red King, 61.
VII. The Fight at Crecy, 73.

Up our Rivers, with Maps :—
I. The Thames, 5.
II. The Severn, 17.
III. The Trent, 30.
IV. The Yorkshire Ouse, 43.
V. The Great Ouse, 55.
VI. The Tyne, 67.
VII. The Tweed, 78.
VIII. The Clyde, 88.

The *SCHOOLMASTER* says:—'Admirable in every respect.'

HUGHES'S
STANDARD STORY BOOKS.

Large Type—Beautifully Illustrated—Strongly Bound.

STORIES FOR INFANTS, 64 pp. ... ... *4d.*		*STORIES FOR STANDARD III., 160 pp.* ... ... *10d.*	
STORIES FOR STANDARD I., 96 pp. ... ... *6d.*		*STORIES FOR STANDARD IV., 224 pp.* ... ... *1s.*	
STORIES FOR STANDARD II., 128 pp. ... ... *8d.*		*STORIES FOR STANDARD V., 288 pp.* ... ... *1s 6d.*	

STORIES FOR STANDARD VI., 320 pp., 2s.

☞ *These books exactly fulfil the conditions of ordinary Readers as set forth in the recently issued 'Circular to Inspectors.'*

OPINIONS OF THE PRESS.

THE TEACHER says:—'We praised with unusual warmth the earlier books, and are pleased to find that the latest addition is worthy of its predecessors. We have in this book stories of famous London buildings, of travel, of animals, of heroes, and stories from English and Scotch history. We congratulate Mr. Hughes on the excellence of the "Stories," and we congratulate the children into whose hands they may fall.'

THE IRISH TEACHERS' JOURNAL says:—'The stories are not only interesting, but are, at the same time, well worth remembering. The pupil who reads of the Adventures of Alfred, the Death of Harold, the Adventures of Robin Hood, the Battle of Crecy, the Loss of the White Ship, and similar stories, is not likely to rest satisfied until he acquires a more extensive knowledge of the history of his country. But the stories are in sufficient variety to suit the tastes of readers having no love for history. Geography, Natural History, Biography, and Domestic Economy have been laid under contribution, in order to furnish materials for one of the most charming Readers which can possibly be placed in the hands of an intelligent boy or girl.'

THE SCHOOLMASTER says:—'They are original, interesting, and attractive, and cannot fail to create a love for reading. They only require to be known to be appreciated.'

PAPERS FOR TEACHERS says:—'They are charmingly written.'

THE SCHOOL AND UNIVERSITY MAGAZINE says:—'Deserve our highest commendation, and we unconditionally accord it to them. Worthy of the young and enterprising publishing house whose imprint it bears.'

THE SCHOOL BOARD CHRONICLE says:—'They cannot hardly fail to be favourite reading with the little ones.'

THE SCHOOL GUARDIAN says:—'Just the sort of book to make a child try to read it for the amusement it affords. The point of all the tales is to teach kindness to animals—a most necessary lesson for young children, which could not be better enforced than it is here.'

THE JOURNAL OF EDUCATION says:—'They are marvels of cheapness. The selection of poetry seems to us particularly happy.'

THE TEACHER'S ASSISTANT AND STUDENT'S MAGAZINE says:—'Not only suitable language, but suitable thoughts and subjects are pressed into the service, if we may say so; and the result is Story Books which children, as soon as they begin to read at all, will love to read on every opportunity.'

THE SCHOLASTIC WORLD says:—'Intended to make the path of reading as pleasant as possible to little learners. The stories are well written and interesting, and the language is carefully graduated. The series, so far, leaves little, if anything, to be desired, and is sure to become popular, both for home and school reading.'

THE EDUCATIONAL NEWS (Scotland) says:—'Exactly such a book as an intelligent child would choose for its own reading.'

THE EDUCATIONAL CHRONICLE says:—'The arrangement and construction of these books have been carried out with utmost care. In the volume now before us (Standard V.) these features of excellence have been equally well sustained. In addition to the "Stories of Famous London Buildings," "Stories from English and Scottish History," and "Stories of Travel, of Animals, and of Heroes," we are pleased to see a Domestic Economy Lecture, the four chapters of which are certain to prove attractive reading, for the girls especially. We cordially recommend the series.'

A FEW UNSOLICITED TESTIMONIALS FROM TEACHERS.

'They have no rival, I think, in the school-book market.'
Mr. GEO. ATKINSON, Noble Street School, Bolton.

'My expectations have been greatly surpassed. I am quite sure from their interesting and varied contents, that the dullest children with these books will be incited to take a newer and livelier interest in their reading lessons.'
Mr. T. C. ELLIOT, Springfield Board School, Sheffield.

'I think Standard III. excellent.'
Miss CRADDOCK, Head Mistress, Albany-rd. Bd. Sc., London.

'I consider it (Standard V.) an excellent book.'
Mr. MOSSFORD, Head Master, Woolmore-st. Bd. Sc., Poplar, London.

'Thanks for your Standard V. Story Book. It is an excellent book: the children prefer it to any of their other Readers.'
Mr. DUNMON, Head Master, Crown-st. Bd. Sc., Soho, W.C.

'I cordially approve of them.'
Mr. S. H. WALSH, St. Paul's Schools, Bolton.

'Charming Story Books. They almost make me wish that I were a youngster again, so that I might have the pleasure of learning to read from them.'
Mr. WALKER, Cathedral Boys' School, Ripon.

'Will make an excellent second set.'
Mr. A. GARDNER, Head Master, Board School, Leeds.

'I cannot conceive a set of books that can in any way bear comparison with them for the purpose designed—teaching to read. Every line is full of interest and delight.'
Mr. JAMES, British School, Hadleigh, Suffolk.

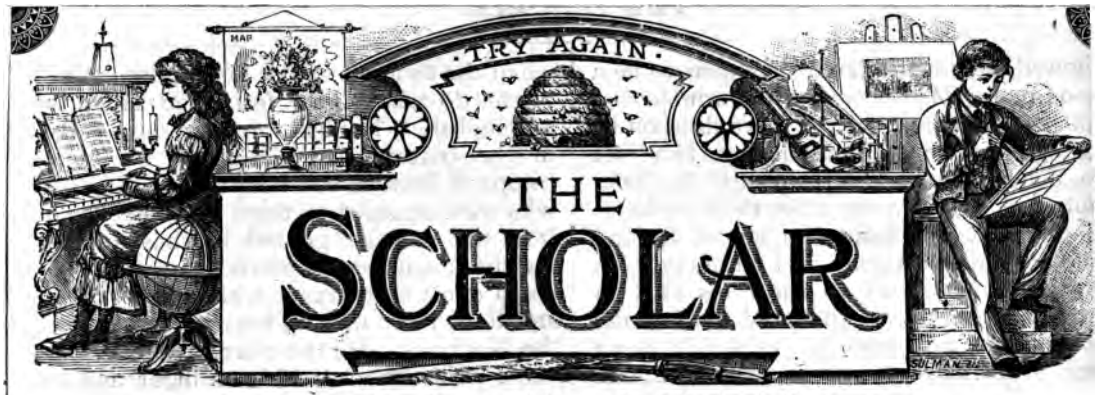
'The best I have seen.'
Mr. SAUNDERS, Ashburnham School.

'I cannot help expressing my great pleasure at making their acquaintance. They are equal, as ordinary school Readers, to any now in the market, but as supplementary Readers they will be invaluable, being so well calculated to relieve the tedium of school drudgery.'
Mr. MOULD, Brayton School, Selby.

'I think they are capital; but the strongest testimony I can give you as to their answering the purpose for which they were written is to be found in the avidity with which my children read them.'
Mr. STATHER, Hillhouse Board Schools, Huddersfield.

*** *SPECIMENS SENT POST FREE.*

London: JOSEPH HUGHES, Pilgrim Street, Ludgate Hill, E.C.



A Monthly Educational Paper for School and Home.

Conducted by JOSEPH HUGHES.

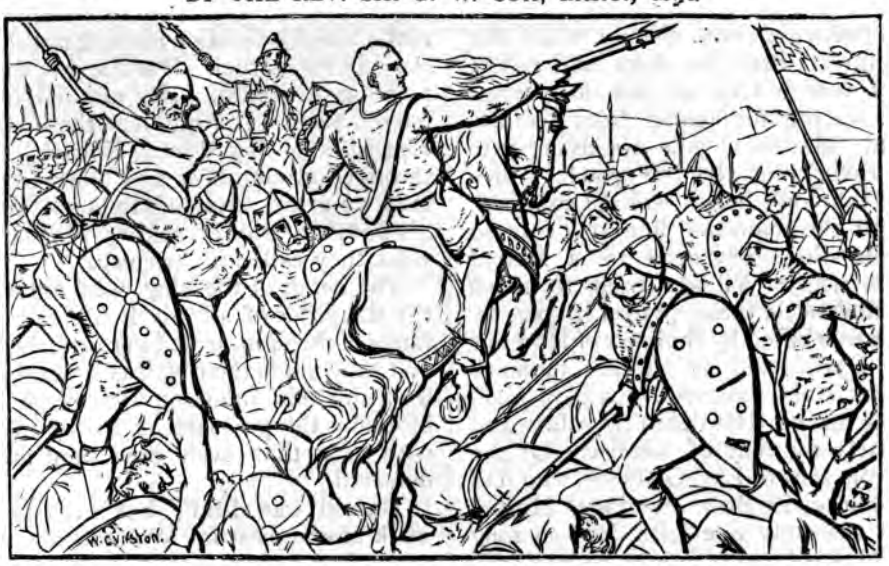
No. 1. Vol. I.] MARCH, 1882. [Price ½d. Per post, 13 copies for 7½d.

CONTENTS.

1. Stories from English History.—I. Fight at Senlac .. 1
2. Gems from the Poets 3
3. Up our Rivers.—I. The Thames. With Map 5
4. Arithmetic for Standards III., IV., V., VI., VII. .. 6
5. Algebra 8
6. Freehand Drawing Copies 9
7. Domestic Economy 10
8. Music—Come, Gentle Spring 11
9. Dictionary 12
10. 'The Scholar's Money Prize Competitions 12

Stories from English History. I.—The Fight at Senlac.

BY THE REV. SIR G. W. COX, BART., M.A.



THE last preparations were now made on either side. The Norman duke called for his coat of mail. As he put it on, the forepart was by some mischance turned hindmost. The sign seemed not less discouraging than his stumble on the beach when he landed from the *Mora*; but with the same readiness which he then

[ALL RIGHTS RESERVED.]

showed, he now declared the omen to be a good one. The turning of the armour betokened that the owner of it would soon be changed from a duke into a king. If we are to believe the tale, the minstrel Taillefer obtained his leave to strike the first blow. Shouting verses from the lay of Roland and of Charlemagne, and throwing his sword up in the air to show his skill in catching it again, he advanced towards the English barrier, and having struck down one or perhaps two men, was forthwith slain. The fight now began in earnest; and the struggle was one of the fiercest of which the history of any country has retained a record. The Norman attack was made at nine o'clock in the morning, and the shades of evening were fast closing in when the death of the heroic English king decided the issue of the day. It was decided for the precise reason of which Harold had forewarned his soldiers at the outset.

So long as his orders were obeyed, all went well for the English. The Norman host was in dire confusion, and the confusion was deepened into dismay when the rumour spread that the duke had fallen. The day was indeed all but lost, when William, tearing the helmet from his face, cried out, 'Madmen! you are flying into death; victory lies behind you! I live still, and by God's help I will yet conquer.' At length the Norman line was formed again, and they advanced to a second attack, in which William tried to reach Harold and settle their quarrel in person. His horse was killed by the lance of Harold's brother, Gyrth; but in another moment Gyrth was slain, crushed by a blow from William's mace. His death was followed immediately by that of Leofric. Of the three heroic sons of Earl Godwine, who had stood by the English standard, Harold was now the only one left. But so long as Harold lived, there might be not only hope, but a reasonable expectation of victory.

The day was wearing on, and William's heart was beginning to sink within him, when the thought struck him that cunning might do what brute force had failed to accomplish. He had already seen, early in the battle, that the flight of some troops of Bretons had tempted the English who were opposed to them to come down from the vantage ground in chase of the fugitives; and he was aware that, unless he could effect an entrance within the English stockade, there was no hope of success for the Normans. He therefore gave orders to some of his troops to feign a flight, and to others, that while these should draw the English after them, they should rush in by the space so left open. The trick was rewarded with a fatal success. Harold's orders were again disobeyed by his light-armed troops, and although they fought nobly to retrieve their error, the strength of their original position could not be recovered. But the issue of the day was still very doubtful, and Harold was still alive and unwounded, when William ordered his archers to shoot their arrows high into the air. The iron shower soon made awful execution in the English ranks. An arrow struck Harold in the eye, piercing his brain. His axe fell from his hand, and in a few minutes the undaunted English king lay dead. Norman knights thronged around him, and Norman gentlemen were not ashamed to hack and hew his body by way of taking vengeance for what they called his perjury.

The death of the king was followed by the slaughter of all his house-carls. The ranks of the light-armed were utterly broken, and they made their way as best they could from the field, inflicting as they went such blows on the pursuers as to fill them still with fear that even now they might be defeated.

Harold was dead; but even then the work of conquest for William was scarcely more than begun. Had Harold lived, it is more than likely that, even though the day was lost at Senlac, William's enterprise would have ended in complete discomfiture. But there was none to take his place; and

for the moment no one was suffered even to give to his body the rites of Christian burial. To the prayer of Harold's mother that he should allow the body to be borne to the church of his minster at Waltham, William answered, it is said, 'He guarded the shores of England while he lived; let him guard them still, now that he is dead.' He could have uttered no worthier e over the fallen hero; but after a ti seems to have relented, for there can little doubt that the body was reve laid to rest near the high altar at Wal as that it had at first been cover a great heap of stones on the co Sussex.

Gems from the Poets.

WILLIAM SHAKSPERE.

1564-1616.

WILLIAM SHAKSPERE, son of Shakspere, glover and sometime man of Stratford-on-Avon, and Mary A daughter of Robert Arden of Wilmeco wife, was born on the 23rd of April, 1 his father's house in Stratford. Very is known of his early life, but it is ge supposed that he left school at fifteen, ar occupied as a lawyer's clerk for a y two. He was married at eighteen to Hathaway, a yeoman's daughter of Sh He had three children born to him time he had attained his twenty-first ye it is thought that, being in hard circums at that time, he went to London and Burbage's company at the Globe T He rose rapidly in his profession, and turning playwright, produced in the next years no less than thirty-seven dramas. His earliest work, 'Venus and Adonis, cated to Lord Southampton, made him famous as a poet; and in 1609, when he re to Stratford-on-Avon, he was rich, and well known to his contemporaries. H himself a new house, it is supposed on the site of his birthplace, and here, in 16 the anniversary of his birthday, he died. His best tragedies are 'Romeo and 'Hamlet,' 'Julius Cæsar,' and 'King Lear;' his comedies, 'Merchant of Venic Henry Plays, and 'As you like it,' with 'Merry Wives of Windsor'; his hi Richard II. III. and 'King John;' and his plays of the later period, 'Cymbeli 'Tempest,' and 'Henry VIII.,' the latter of which was his last production.

J. S. FLETC

THE SEVEN AGES OF MAN.

From *As you like it.* Act ii., Scene 7.

Jaques.— All the world's a stage,
And all the men and women merely players:
They have their exits, and their entrances;
And one man in his time plays many parts,
His acts being seven ages. At first, the in
Mewling and puking in the nurse's arms.
Then the whining school-boy, with his satc
And shining morning face, creeping like sn

Unwillingly to school. And then the lover,
Sighing like furnace, with a woeful ballad
Made to his mistress' eyebrow. Then, a soldier,
Full of strange oaths, and bearded like the pard,
Jealous in honour, sudden and quick in quarrel,
Seeking the bubble reputation
Even in the cannon's mouth. And then, the justice,
In fair round belly, with good capon lined,
With eyes severe, and beard of formal cut,
Full of wise saws and modern instances;
And so he plays his part. The sixth age shifts
Into the lean and slipper'd pantaloon,
With spectacles on nose, and pouch on side;
His youthful hose, well saved, a world too wide
For his shrunk shank; and his big manly voice,
Turning again toward childish treble, pipes
And whistles in his sound. Last scene of all,
That ends this strange eventful history,
Is second childishness and mere oblivion;
Sans teeth, sans eyes, sans taste, sans everything.

ANTONY'S ADDRESS TO THE ROMANS.

From *Julius Cæsar.* Act iii., Scene 2.

Friends, Romans, countrymen, lend me your ears:
I come to bury Cæsar, not to praise him.
The evil that men do lives after them,
The good is oft interred with their bones;
So let it be with Cæsar. The noble Brutus
Hath told you Cæsar was ambitious:
If it were so, it was a grievous fault,
And grievously hath Cæsar answered it.
Here, under leave of Brutus and the rest,
(For Brutus is an honourable man,
So are they all, all honourable men,)
Come I to speak in Cæsar's funeral.
He was my friend, faithful and just to me:
But Brutus says he was ambitious;
And Brutus is an honourable man.
He hath brought many captives home to Rome,
Whose ransoms did the general coffers fill:
Did this in Cæsar seem ambitious?
When that the poor have cried, Cæsar hath wept:
Ambition should be made of sterner stuff:
Yet Brutus says, he was ambitious;
And Brutus is an honourable man.
You all did see, that on the Lupercal
I thrice presented him a kingly crown,
Which he did thrice refuse: was this ambition?
Yet Brutus says, he was ambitious;
And, sure, he is an honourable man.
I speak not to disprove what Brutus spoke,
But here I am to speak what I do know.
You all did love him once, not without cause:
What cause withholds you then to mourn for him?
O judgment! thou art fled to brutish beasts,
And men have lost their reason!—Bear with me,
My heart is in the coffin there with Cæsar,
And I must pause till it come back to me.

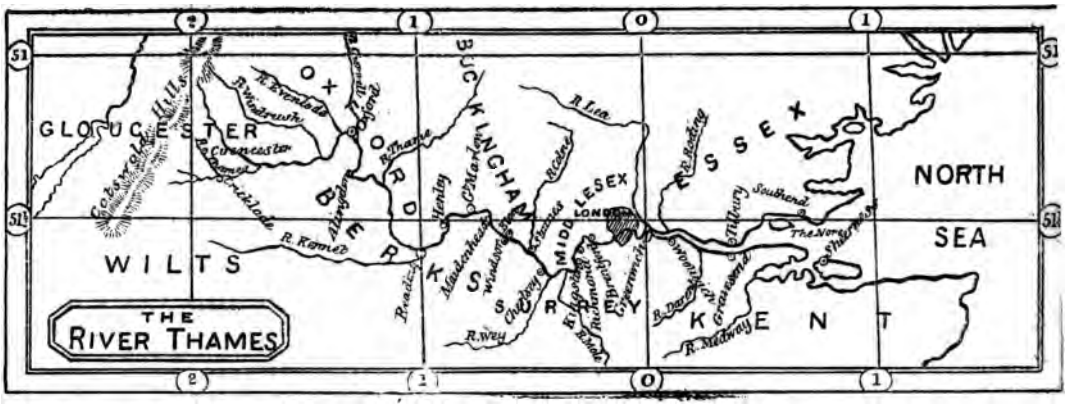
MILTON.

1608—1674.

PARADISE LOST. Book iii.

A Hymn to Light, with allusions to Milton's own blindness.

Hail, holy Light! offspring of Heaven first-born,
Or of the Eternal co-eternal beam,
May I express thee unblamed? Since God is Light,
And never but in unapproached light
Dwelt from eternity,—dwelt then in thee,
Bright effluence of bright essence increate!
Or hear'st thou rather, pure ethereal stream,
Whose fountain who shall tell? Before the Sun,
Before the Heavens, thou wert, and, at the voice
Of God, as with a mantle did'st invest
The rising World of waters dark and deep,
Won from the void and formless infinite.
Thee I revisit now with bolder wing,
Escaped the Stygian pool, though long detained,
In that obscure sojourn, while, in my flight
Through utter and through middle darkness borne,
With other notes than to the Orphéan lyre,
I sung of Chaos and eternal Night,
Taught by the heavenly muse to venture down
The dark descent, and up to re-ascend,
Though hard and rare. Thee I revisit safe,
And feel thy sovran vital lamp; but thou
Revisit'st not these eyes, that roll in vain
To find thy piercing ray, and find no dawn;
So thick a drop serene hath quenched their orbs,
Or dim suffusion veiled. Yet not the more
Cease I to wander where the muses haunt
Clear spring, or shady grove, or sunny hill,
Smit with the love of sacred song; but chief
Thee, Sion, and the flowery brooks beneath,
That wash thy hallowed feet, and warbling flow,
Nightly I visit: nor sometimes forget
Those other two equalled with me in fate,
So were I equalled with them in renown,
Blind Thamyris and blind Mæonides,
And Tiresias and Phineus, prophets old:
Then feed on thoughts, that voluntary move
Harmonious numbers; as the wakeful bird
Sings darkling, and, in shadiest covert hid,
Tunes her nocturnal note. Thus, with the year,
Seasons return; but not to me returns
Day, or the sweet approach of even or morn,
Or sight of vernal bloom, or summer's rose,
Or flocks, or herds, or human face divine;
But cloud instead, and ever-during dark
Surrounds me, from the cheerful ways of men
Cut off, and, for the book of knowledge fair,
Presented with a universal blank
Of nature's works, to me expunged and rased,
And wisdom at one entrance quite shut out.
So much the rather thou, Celestial light,
Shine inward, and the mind through all her powers
Irradiate; there plant eyes; all mist from thence
Purge and disperse, that I may see and tell
Of things invisible to mortal sight.



Up our Ribers.

I.—THE THAMES.

LET us take an imaginary trip up the river Thames, and note the chief points of interest on our way. We will begin first at the Nore Light-ship, which is generally considered to mark the point at which the Thames ends, and the German Ocean or North Sea begins. This light-ship is situated where the Medway pours its waters into the main stream, and as the navigation here is very intricate, owing to the numerous sand and mud banks, it is of great assistance to sailors.

Proceeding almost due west up the stream, having Essex on our right hand and Kent on the left, we soon leave the thriving watering-place, Southend, behind us, with perhaps now and then the heavy boom of the guns being tried at Shoeburyness to draw our attention to that side of the river. We then traverse Gravesend Reach, pass Tilbury Fort, which recalls to our minds Queen Elizabeth and old Armada days, and on the southern side the busy town of Gravesend, and stretch onwards towards Erith, near which the river Darent joins the Thames. Ten miles farther up is Woolwich, a great military depôt and arsenal, where arms of all descriptions, from the eighty-one-ton gun downward, are manufactured and stored.

A few miles more bring us to Greenwich, remarkable for its Hospital and Observatory, and the region of Docks, which line both sides of the river for some miles, and being generally crowded with ships of all sorts and sizes, seem regularly to bristle with masts and spars. The river Lea here joins the Thames on the northern side. The docks continue pretty nearly until we reach the Tower of London, a gloomy-looking fortress on our right going up, just before we come to the first bridge over the Thames—London Bridge.

We cannot afford space here to mention in detail all the interesting buildings we see while passing through London; it must suffice to say, that in the seven or eight miles of our journey through the metropolis we go under about a dozen bridges, catch a glimpse of St. Paul's Cathedral, Cleopatra's Needle, and the Houses of Parliament on the right, and Lambeth Palace on the left, and rapidly find the river getting clearer as we leave the City behind us.

The next town of any size we come to is Brentford, on the north, with Kew, celebrated for its Gardens and Observatory, on the opposite side.

From these, passing several 'aits' or 'eyots,' as the islands in the river are called, we soon reach Richmond, with its famous Star and Garter Hotel.

Onwards past Kingston, with Hampton Court on the opposite northern side of the river, past the mouths of the Mole and Wey, and we soon reach Chertsey, in the stretch between which and Windsor, whose castle is a striking feature on the southern bank, we pass Staines, near the mouth of the Colne, Runnymede, and Magna Charta Island, famed in the annals of King John. Opposite Windsor is Eton, celebrated for its school. The next large town we arrive at is one famous for its biscuit factories—Reading, at the junction of the Thames and Kennet—before reaching which, however, we leave behind us Maidenhead, Great Marlow, and Henley.

After passing Reading (with the counties Oxfordshire and Berkshire on the north and south respectively) and the mouth of the tributary Thame, which is said to give its name to the main stream, and Abingdon, which marks the entrance to the Vale of the White Horse, so called from the figure of a huge horse cut in the turf on the slope of one of its bounding hills, we reach the great university city, Oxford.

Above this the Thames is called the Isis, and rapidly narrows as we draw nearer its source. We pass the points at which the Evenlode and Windrush join the main stream, and the country town of Cricklade, and, taking the small river Churn as the originating stream of the river Thames (it is thus marked in the map above), we find it rises at a place called the Seven Springs, in the Cotswold Hills, Gloucestershire. Another source, a rival to the foregoing, is known as Thames Head, and lies some miles to the south-west of the town of Cirencester.

SUMMARY.

Source	Cotswold Hills, in Gloucestershire.
Course	Due east.
Length	210 miles.
Counties on Northern Bank	Oxford, Buckingham, Middlesex, and Essex.
Counties on Southern Bank	Berkshire, Surrey, and Kent.
Tributaries on Left Bank	Windrush, Evenlode, Cherwell, Thame, Colne, Lea, and Roding.
Tributaries on Right Bank	Kennet, Wey, Mole, Darent, and Medway.
Towns on its Banks...	Cirencester, Cricklade, Oxford, Abingdon, Reading, Henley, Great Marlow, Maidenhead, Windsor, Eton, Staines, Chertsey, Kingston, Richmond, Brentford, London, Greenwich, Woolwich, Gravesend, Tilbury, Southend, and Sheerness.

Arithmetic. STANDARD III.

A. 1. Divide 2464 by 13.
2. „ 4657 by 23.
3. „ 67401 by 31.

B. 1. Divide seventy thousand and sixteen by 29.
2. „ (601823 – 48719) by 37.
3. „ (74183 × 36) by 72.

C. 1. Divide nine hundred and six thousand and forty by 108.
2. Take £68 14s. 7½d. from £1,000.
3. Add together £701 16s. 8½d., £968 14s. 6¾d., £2010, £19 17s. 10d., and £673 14s. 8¼d.

D. 1. From £857 take 857 crowns.
2. Divide 7182143 by 847.
3. If the dividend be 1,013,008, and the divisor be 4078, find the quotient.

E. 1. Add together 618 crowns, 731 half-crowns, 9000 florins, and 7169 farthings.
2. Bring 8176219 farths. to £ s. d.
3. How many twopences are there in 8179 guineas?

F. 1. Subtract £746 18s. 2½d. from £4000, and bring the remainder to farthings.
2. Find the difference between 1768 crowns and 2183 florins.
3. Divide 81764151 by the difference between 4184 and 7946.

Advanced Examination.

1. From £601481 17s. 1d. take £5050 16s. 9¾d.

2. Oranges are 3 for 2d., and four boys buy 6½ dozen, and share them equally. What has each to pay?

3. An orchard contains 180 apple trees, which produce on an average 1200 apples each tree. If 8 apples weigh a lb., and they sell at 1½d. a lb., what is the whole crop worth?

STANDARD IV.

A. 1. Multiply £48 17s. 6¾d. by 18.
2. ,, £667 16s. 7¾d. by 66.
3. Divide £8173 16s. 9½d. by 16.

B. 1. Multiply £7121 15s. 5½d. by 84.
2. ,, £481 17s. 2½d. by 600.
3. How many ounces are there in 5½ tons?

C. 1. Bring 7½ million ounces to tons, etc.
2. How many square feet are there in 13½ acres?
3. If 2½ tons of coal cost £1 17s. 6d., what would 1½ ton cost?

D. 1. Multiply £419 17s. 9½d. by 1014.
2. What would 965 needles cost at 3d. a score?
3. Divide £136835 16s. 5d. by 319.

E. 1. Bring 61741539 sec. to days, etc.
2. How many seconds are there from Monday morning at a quarter-past six, to the following Saturday at 9.25 p.m.?
3. Divide £63174 8s. 8½d. by 5463.

F. 1. Bring 50007090 drams to tons, cwt., etc.
2. If bricks are 25s. 6d. a thousand, how many could be bought for £255 19s. 1½d.?
3. 1897 yd. 1 qr. 1 nl. 1½ in. × 300.

ADVANCED EXAMINATION.

1. A grocer bought 2½ ton of soap for £56 12s. 6d., and he sold it a 3½d. a lb., how much did he gain or lose?
2. A joiner's working week contains 54 hours at 7½d. an hour, but at the end of the week he only receives £1 10s. 11½d., how many hours was he off work?
3. If 4 horses be worth 5 cows, and 3 cows be worth £58 10s., what would 20 horses be worth?

STANDARD V.

A. 1. 4081 oranges at ½d. each.
2. 7169 ,, ¾d. ,,
3. 91873 ,, 1¼d. ,,

B. 1. 4556 books at 8¾d. each.
2. 1630 ,, 1s. 4½d. each.
3. 8147 ,, 3s. 4½d. ,,

C. 1. 9150 coats at 18s. 10½d. each.
2. 8417 ,, £1 19s. 8½d. ,,
3. 9104 ,, £3 14s. 2½d. ,,

D. 1. 15 ton 16 cwt. 2 qr. at £5 10s. a ton.
2. 17 yds. 2 qr. 2 nl. at 9s. 6d. a yd.
3. 37 ac. 0 rd. 16 per. at £8 18s. 8d. an acre.

E. 1. 27 qrs. 1 bu. 1 pk. of oats at £1 18s. 8d. a qr.
2. 25 lb. 10 oz. 10 dwt. at £3 2s. 6d. a lb.
3. 5 sq. yd. 4 ft. 80 in. at 17s. 6d. a sq. yd.

F. 1. Nine bears the same ratio to a certain number as 2 does to 7;—what is the number?
2. If 9 men do a piece of work in 15 days, in what time could 36 men have done it?
3. What would 780 oranges cost if 80 cost 3s. 10d.?

ADVANCED EXAMINATION.

1. Make out this bill in proper order, and then settle it:—
150 bales of Indian cotton, each 330 lb., at 7½d. a lb.
450 bales of Sea-island cotton, each 400 lb., at 9½d. a lb.
300 bales of Egyptian cotton, each 350 lb., at 7¾d. a lb.
225 bales of Peruvian cotton, each 340 lb., at 7¼d. a lb.
2. The wages for 12 months of a captain, two mates, and 16 men amount to £1134. The captain receives twice as much as the 1st mate, who receives 1½ as much as the 2nd mate, whose share is equal to that of two men. Find the monthly wage of each.
3. Find, by practice, the value of 256 gal. 3 qts. ½ pt., at 11s. 7½d. a gl.

STANDARD VI.

A. 1. $\frac{1}{2} + \frac{2}{3} + \frac{3}{4} + \frac{7}{8}$.
2. Take $5\frac{1}{2}$ from $\frac{3}{4}$ of $9\frac{1}{3}$.
3. $(4\frac{3}{5} - 2\frac{1}{2}) \div 6\frac{7}{8}$.

B. 1. ·025 + 1·81 + 70·0725.
2. (4·835 − 2·9175) ÷ ·025.
3. Bring 6s. 4½d. to the dec. of £2.

C. 1. If 6 girls make 20 shirts in 8 days, how many could 40 girls make in 12 days?
2. In what time could 18 men build a wall 400 yds. long, if 9 men build a wall 120 yds. long in 12 days?
3. If 180 sheep eat 18 ton of hay in 150 days, how many ton would 630 sheep eat in 450 days?

D. 1. $8\frac{3}{8} + 2\frac{7}{10} + 4\frac{3}{5} + 9\frac{1}{12}$.
2. If $\frac{3}{8}$ of an estate be worth £10720, what is the whole estate worth?
3. $(13\frac{1}{2} - 8\frac{3}{4}) + (8\frac{5}{8} \div 11)$.

E. 1. £17·1 + 34·35 cr. + 4·72 gs. + 14·44 florins.
2. What would ·525 ton of tea cost at ·285s. an oz.?
3. (3·725 ÷ ·05) + (·45075 ÷ 125).

F. 1. $\frac{3}{5} + \frac{3}{4} + \frac{5}{8} + \frac{5}{6} + \frac{9}{7}$.
2. ·475 day − 8·96 hr., —bring the rem. to vulgar fraction (v. f.) of a fortnight.
3. A carpet 20 feet long and 14 broad cost £5 12s. 6d.: find the cost of one 36 ft. by 32.

ADVANCED EXAMINATION.

1. $\frac{16\frac{3}{4} \div 12\frac{1}{2}}{5\frac{5}{8}} \div \frac{19\frac{1}{3} - 17\frac{1}{4}}{8\frac{3}{4} + 4\frac{5}{8}}$

2. If 6 lb. of mutton cost 3·528s., what will $10\frac{1}{2}$ lb. of beef cost, supposing beef 1·11 times the value of mutton?

3. How many lbs. of beef will last 80 *women* for 400 days, if 8 *men* ate 70 lb. in 15 days,—3 men requiring as much as 4 women?

STANDARD VII.

A. 1. $(64'35+1'25)+('0011+'005)$.
2. Find simple interest of £1906 for 3½ years at 3½ per cent.
3. Find compound interest of £1695 for 4 yrs. at 5 p. c.

B. 1. In what time will £475 amnt. to £592 11s. 3d. at 2½ p. c. simple interest?
2. Find the sq. root of 16630084.
3. At what rate p. c. would £325 amount to £368 17s. 6d. in 4½ years?

C. 1. Find the int. of £583 4s. 4d. for 30 days at 4 p. c.
2. What principal will amount to £400 in 3 years at 4. p. c. simple interest?
3. Find the cube root of 12167.

D. 1. In what time would a sum of money double itself at 3, 4, and 5 p. c. respectively, simple int.?
2. In how many days, at 4 p. c., would £500 make 19s. 6d. int.?
3. If ⅞ of a ship be worth £10,000, what is ⅔ of $\frac{7}{9}$ of the ship worth?

E. 1. Bring 6s. 10½d. to the dec. of £20,000.
2. What would £2,000 amount to in 9 months at 5 p. c. comp. int. payable quarterly?
3. At what rate p.c. would £10,975 amount to £12,520 12s. 11d. in 3¼ yrs., simple interest?

F. 1. What would £495 5s. amnt. to in 4 yrs. 120 dys. at 2½ p. c., simple interest?
2. What sum of money out at int. would amount to £213 15s. in 3¾ yrs. at 5 p.c., sim. int.?
3. How many minutes from Apl. 14th, 1879, at 9.25 p.m., to March 1st, 1882 at 6.47 a.m.?

ADVANCED EXAMINATION.

1. Find what £2137 10s. would amt. to from May 11th, 1880, to Jan. 17th, 1882 (the latter exclusive), at 4 p. c., simple int.?

2. By selling cheese at 8½d. a lb. a grocer gains 16 p. c. on the prime cost. What did it cost him a cwt.?

3. A rectangular field containing 15 acres is three times as long as broad; find its length and breadth in yards.

(The Answers to the Arithmetic appear in the March number of the *Practical Teacher*.)

Algebra.

BY W. H. HARVEY, B.A. (LONDON).

Algebra differs from arithmetic in that we use *letters*, and not figures, to represent quantities.

The figures *in arithmetic*, when used singly, have certain *definite* and *particular* values which cannot be altered: thus the symbol or figure 5 can never be taken to mean anything more or less than 5 units, nor can 6 mean anything other than 6, and so on, whereas—

In algebra, the letters we employ may have *any* values we like to ascribe to them, provided only we keep to those values throughout the whole of the operation on which we are engaged.

Signs.—The signs used in algebra are the same as those in arithmetic.

The most important with which we shall deal in the following exercises are:—

The sign = (read 'equals') means that the quantities between which it is placed are equal to one another.

The sign + (read 'plus' or 'added to') is the sign of addition, and means that the quantity before which it stands is to be *added*.

Quantities having + before them are called *positive*.

If no sign occur before a quantity, + is always to be understood, thus a means $+a$.

The sign − (read 'minus' or 'lessened by') is the sign of subtraction, and means that the quantity before which it is placed is to be *subtracted*.

Quantities having − before them are called *negative*, thus $-a$ is a negative quantity.

The sign × (read 'into' or 'multiplied by') is the sign of multiplication, and denotes that the quantities between which it stands are to be *multiplied together*.

Multiplication may also be expressed by means of a dot, or by writing the quantities close together with no sign between them.

Thus $a \times b \times c$ may be written $a \,.\, b \,.\, c$ or abc.

We must here draw attention to a difference in the notation employed in *algebra* and that in *arithmetic*.

In *algebra*, abc means $a \times b \times c$.

In *arithmetic* $a\ b\ c$ would mean a hundreds of units + b tens of units + c units, just as 345 means 3 hundreds + 4 tens + 5 units.

The sign ÷ (read 'divided by') is the sign of division, and means that the quantity before it is to be divided by the quantity following it: thus $a \div b$ means that a is to be divided by b. Another way of expressing division is in the fractional form $\frac{a}{b}$ which means $a \div b$.

Brackets (.....) {.....} [.....] have precisely the same use as in arithmetic, and serve to connect and make − one of all the quantities they contain.

Expression.—Any collection of letters and signs in algebra is called an *expression.*

Terms.—Those parts of an expression which are connected by + or − are called *Terms:* thus, in the expression,

$$-6abc + a + 2d - ax.$$

The terms are,

$$6abc,\ a,\ 2d,\ \text{and}\ ax.$$

With these explanations we can proceed to

EXERCISE I.

If $a=1$, $b=2$, $c=3$, $d=4$, $e=5$, and $x=0$, find the value of

(1) $a + b + c + d + e + x.$

(2) $a + 2b + 3c + 4d.$

(3) $a - b + c - d + e.$

(4) $2a + 3b - 4c - 4d + 5e.$

(5) $ab + bc - de.$

(6) $4abc - 3dex.$

(7) $-abc + bcd + cde - dex.$

(8) $5ab + 3de - 7bc - 3e.$

(9) $-60ca + 200bc + 75bcd.$

(10) $5abc - 4cde + 6ce - 7ex.$

(11) $\frac{a}{b} + 5c + \frac{c}{d}.$

(12) $-\frac{b}{c} + \frac{c}{d} + \frac{x}{e}.$

(13) $4bcde \div 2be.$

(14) $2c \times 5d \div 3x.$

(15) $7a \times 6b - 2c \times 3x.$

(16) $\frac{a}{b} \times \frac{c}{d} \times \frac{d}{e}$

(17) $\frac{ab}{bc} + 2ab \times 3i + \frac{dx}{5}.$

(18) What would be the value of (5) if the arithmetical notation were employed?

(19) Express in the algebraic method the sum, difference, product, and quotient of a and b.

(20) How many pence are there in x pounds?

(21) Divide x £ equally amongst y people.

(22) If x represents a certain number, how would you represent (1) half the number, (2) double the number, (3) its excess above 7?

NOTE.—The answers to the above will be found in the March number of the *Practical Teacher.*

Freehand Drawing Copies.

The Pith of a Course of Domestic Economy Lessons.

BY MRS. WIGLEY,

Author of 'The Marshfield Maidens,' etc.

LESSON I.

DOMESTIC ECONOMY teaches the management of the home. Girls like to manage. They find a good deal of pleasure in the exercise of skill and tact and cleverness in order to make things fit in *nicely* when it seems next to impossible to get them to fit in at all. This is a very good thing, for girls have to manage all their lives long.

Manage what? Why, manage the homes and all belonging to them. And if they know how to do this *well*, they know how to carry on the most important business in the whole world.

Think a moment. What are the wisest men in our country trying to do? Why do they make laws and get acts passed about this thing or that thing? They want to make England healthy, happy, and prosperous. Well, suppose all the women and girls were able to make their own homes just these three good things, then we should have healthy, happy, and prosperous towns made of the homes, and healthy and happy and prosperous counties made of the towns, and a healthy, happy, and prosperous Old England made of these counties. So if every home was what it is woman's especial work to make it, all the most difficult questions in political economy would be settled at once.

LESSON II.

THERE is a good deal more in home management than some people would think. It is not merely lighting a fire, or sweeping a room, or getting the dinner ready. The home manager has to study the best way to secure the health, happiness, and prosperity of every member of her household. She must have a thorough and full knowledge of all that will be likely to assist her in securing these great blessings of life for all she loves, and she must have wisdom and skill enough to put that knowledge into practice.

Remember, the words Domestic Economy refer more to *managing* than to saving. Once girls thought there was something *mean* about them. It is not so. Any one who is managing a home well is doing a holy, blessed work. Think of it; a work which will help people to be healthier, to be happier, and to be more prosperous is surely a work to be proud of.

LESSON III.

DOMESTIC ECONOMY has to do with health first of all. Our health depends upon a good many things —upon the food we eat, upon the clothing we wear, and the sort of dwellings we occupy. All these are outside things. And it depends also upon our temper and state of mind, and upon our own natural constitution—these are inside things. You notice I said *the food* we eat. Not *what we eat* nor *something to eat*, but *food*. There is no doubt that we eat a great many things that are not food at all. That only is food for the body which does for it the work which it needs to have done. And it is very important that every girl should know that one sort of food can only do one sort of work. If the body needs one kind of food, and you give it another kind, which it does not need, then you only do mischief and not good. It *does* matter very much that we should be clever about this. We must first know what the body needs, and then give the food which will best supply that need.

LESSON IV.

NOW let us remind ourselves of all that the body needs which food has to supply.

First. Our bodies require to be kept at one regular heat. If we live in India we need something to keep us cool; if we go to the Arctic regions we need something to keep us warm. A certain regular temperature must be kept up in the body. If we get too hot we shall have fever, if we get too cold we shall soon be numbed and dead. It takes less time to kill a person with cold than it does with hunger. You would not die of starvation in the night after you had eaten a good tea. But you might die through cold in a night after you had had a good warm.

Perhaps it is a little hard to understand how food can warm us. This is the way: Almost all solid bodies have something in them that will burn or consume away, and in burning it gives out heat. This part that will burn is called carbon. But something must work upon carbon to make it burn, and this something is found in oxygen gas, which exists in the air we breathe. Whenever oxygen and carbon get together the carbon begins to consume away and to give out heat. If we want fire and flame another gas will have to help, but we had rather not have fire in our bodies, though we want the heat which carbon can give out when it burns away. There is carbon in the food which we put into our bodies, and there is oxygen in the air which we breathe into our bodies. The two work, and heat is produced, the regular heat which keeps us warm.

COME, GENTLE SPRING.

Words by JAMES THOMSON. *Music by* T. CRAMPTON.

Andantino. mf

1st TREBLE.
2nd TREBLE.
BASS.

1. Come, gen- tle spring, with all thy train, Un- loose cold win - ter's i - cy chain;

KEY G. *Andantino. mf*

1st TREBLE.
2nd TREBLE.
BASS.

And with thy life - re - viv - ing breath Wake Na - ture from the sleep of death.

D. t.

Come, bring us sun - shine and fresh - 'ning showers, Stir - ring to life the

F. G. *mf*

legato. *legato.*

sleep - ing flowers; And to our hearts new plea - sure bring, With all the

Symph. *Symph.*

joys of beau - teous spring!

2. Come with your gentle vocal throng
That fill our woods with joyous song;
Waken again the dormant bee,
And clothe anew the leafless tree:
Come, clothe the meadows, now bleak and bare,
With grasses green and daisies fair;
The naked hedgerows, brown and sere,
Array in greenery bright and clear.

3. We long to hear the cuckoo's cry,
The soaring lark sing in the sky,
Uprising high on tireless wing,
To welcome back the joyous spring:
Come with the primrose and fragrant flowers,
To deck again our woodland bowers;
And then a song of praise we'll sing
With grateful hearts to thee, O spring!

Dictionary.

EXPLANATORY LIST OF THE MORE DIFFICULT WORDS OCCURRING IN THIS NUMBER.

Alderman, a town magistrate next in rank below a mayor.
Arsenal, a naval and military store-place and manufactory.
Ballad, a song.
Blank, empty space.
Capon, a fowl.
Celestial, heavenly.
Chaos, confusion.
Charlemagne, Charles the Great, a famous king of the Franks.
Co-eternal, equally eternal.
Comedy, a light cheerful play.
Contemporaries, people living at the same time.
Covert, a place affording concealment.
Darkling, in the dark.
Depôt, a store-place.
Dire, dreadful.
Dramas, plays to be acted.
Drop serene and *suffusion*, literal translations of the Latin terms (*Gutta serena*, and *suffusio*) for the disease of the eyes from which Milton suffered.
Economy, household management.
Effluence, a flowing from.
Epitaph, inscription on a tomb.
Ethereal, heavenly, spiritual.
Ever-during, ever-enduring, everlasting.
Exit, a going-out, departure.
Expunged, blotted out.
Feign, to pretend.
Formal, stiff, regular.
General coffers, public treasury.
Hard and rare, difficult and rarely done.
Heroic, brave.
Hose, stockings, trousers.
House-carls, body-guard.
Increate, not created.
Interred, buried.
Intricate, puzzling.
Irradiate, to fill with light.
Jealous, suspicious.
Lay, poem, song.
Lend me your ears, listen to me.
Lupercal, Roman festival in honour of Pan, the fabled god of woods and shepherds.
Maeonides, Homer.
Metropolis, the mother city, the capital.
Mewling, crying like a cat.
Middle darkness, the gulf between heaven and hell.
Minster, a monastery, cathedral.
Mischance, mishap.
Muse, one of the nine fabled goddesses of Music, Poetry, etc.
Nocturnal, by night.
Oblivion, forgetfulness.
Obscure, dark, gloomy.
Omen, a sign.
Originating, commencing.
Orphean, belonging to Orpheus, a celebrated Thracian poet, who is said to have written a hymn to Night.
Pantaloon, a foolish old man.
Pard, a leopard.
Perjury, false-swearing, falsehood.
Phineus, a blind soothsayer of Thrace.
Playwright, one who writes plays.
Puking, vomiting.
Rased, scratched out.
Relented, softened.
Retrieve, win back.
Rites, religious services.
Sans, without.
Saws, maxims, proverbs.
Sovran, same as *sovereign*.
Stockade, a fenced in place.
Stygian pool, hell.
Suffusion, see *drop serene*.
Thamyris, a Thracian poet, who is said to have challenged the Muses in song, and was by them deprived of sight, voice, and skill.
Tiresias, a blind soothsayer of Thebes.
Tragedy, a sad play.
Vantage, superior, higher.
Vernal, belonging to spring.
Void, empty space.
Voluntary, of their own accord.

WORDS, SOMEWHAT DIFFICULT IN SPELLING, NOT OCCURRING IN THE ABOVE LIST.

Ambitious.
Answered.
Antony.
Armour.
Barrier.
Biscuit.
Circumstances.
Coriolanus.
Decided.
Discomfiture.
Divine.
Domestic.
Earnest.
Elizabeth.
Escaped.
Essence.
Fiercest.
Fugitives.
Furnace.
Generally.
Godwine.
Grievous.
Gyrth.
Hallowed.
Imaginary.
Issue.
Julius Cæsar.
Leofric.
Managing.
Military.
Parliament.
Piercing.
Pursuers.
Regularly.
Reverently.
Revisit'st.
Runnymede.
Satchel.
School.
Shadiest.
Spectacles.
Taillefer.
Vengeance.
Whining.
Whistles.

'The Scholar's' Standard Money Prize Competitions.

I. WRITING.—COX'S COPY BOOKS.

Half-a-guinea will be given to each boy, and half-a-guinea to each girl, for the best-written copy books in the various standards in Cox's Practical Standard Copy Books.

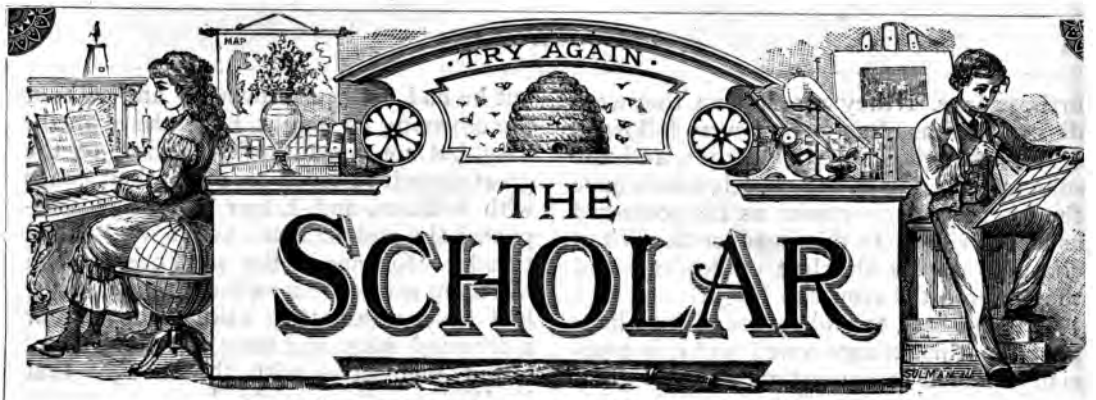
Standard I. ..	Nos. 1, 2, 3	The copy books are 2d. each, and will be sent post free, on receipt of the published price in stamps.
,, II. ..	,, 4, 5, 6	
,, III. ..	,, 7, 8	
,, IV. ..	,, 9, 10	
,, V. ..	,, 11, 12	
,, VI. ..	,, 13, 14, 15	
,, VII. ..	,, 13, 14, 15	

The books must reach the office, carriage paid, not later than May, addressed to

THE EDITOR OF 'THE SCHOLAR,'
Pilgrim Street, Ludgate Hill, London, E.C.

The wrapper should also be marked in left-hand corner, 'The Scholar's Writing Competition.' A separate certificate must be sent, stating that the writer has done the work without help. This certificate must also be signed by either a parent, clergyman, or teacher.

LONDON: PUBLISHED BY JOSEPH HUGHES, PILGRIM STREET, LUDGATE HILL.



A Monthly Educational Paper for School and Home.
Conducted by JOSEPH HUGHES.

No. 2. Vol. I. APRIL, 1882. Price ½d. Per post, 13 copies for 7½d.

CONTENTS.

1. Stories from English History 13
2. Gems from the Poets 15
3. Up our Rivers.—II. The Severn. With Map 17
4. Arithmetic for Standards III., IV., V., VI., VII. .. 19
5. Algebra 21
6. Freehand Drawing Copies 22
7. Domestic Economy 23
8. Music.—The Travelling Tinker 24

Stories from English History. 2. Coronation of the Conqueror.

(*Christmas Day, A.D.* 1066.)

BY THE REV. SIR G. W. COX, BART., M.A.

BY his victory at Hastings, or, as we should rather say, Senlac, William had left the English people without a king. There still remained the young Prince Edgar, of whom we should be apt to speak as the rightful heir by line of descent; but we cannot say that our modern notions of succession were even known to our forefathers

[*ALL RIGHTS RESERVED.*]

in those days. If they were known, they were disregarded as often as they were followed. It was the choice of the people, and the solemn crowning in the church, which gave the monarch such power as he possessed as a sovereign. In this instance the Witan chose to go by the line of descent, and they offered the crown to Edgar.

It is not easy to understand all that happened in this strange time; and it is especially difficult to understand how the great council thought that they would be able to uphold their choice. The man who had conquered Harold was still in the country with his victorious army, and they might see him any day before the gates of London. Edgar was little more than a child, and wholly unfit to deal with the sea of troubles which had burst upon the land. They may have supposed that the very youth and weakness of Edgar might induce the Conqueror to withdraw the claim which he had urged against Harold. It is more likely that the presence of the two great northern earls, Edwin and Morcar, with their forces, might lead them to think that the united English people would still be more than a match for the invader. But Edwin and Morcar had no idea of an English nation, and not the least care for it. They were ready to assent to the election of Edgar, as they had assented to the election of Harold; but they had no intention of fighting for either, and they withdrew their forces now, as they had held aloof when they left Harold to deal as best he could with his namesake of Norway at Stamford Bridge.

Meanwhile the Norman duke was strengthening his hold on the land; and as after the submission of Dover and Canterbury he marched towards London, it must have become plain that something more must be done. If the English could not withstand him, they must submit; and if they must submit, no other way was open to them than to have William for their king. The desertion of the treacherous northern earls made the notion of armed resistance hopeless. Edgar had been chosen king, but he had not been crowned; and without the crowning he might have the name of king, but not his authority. Some of the great council resolved to make their peace with William, and Edgar himself accompanied the ambassadors, who bowed to the invader 'for need,' the sore need which left them no freedom in the matter. They had never lived, they said, except under a crowned king, and they may have comforted themselves with the thought that in William they might have a second Cnut. After taking counsel with his chief men, William accepted the offer, and Christmas day was fixed for the crowning.

On that day the great church of the Confessor witnessed one of the saddest sights on which the eyes of man may rest, a sight the more sad and mournful for its outward pomp and glory. The English who took part in the splendid ceremony had witnessed the same ceremony not twelve months ago within the same walls. Then they had shouted assent to the question which had asked them whether they would have a true-hearted Englishman for their king; now they were there to raise their voices in favour of one who came as a conqueror, that is, as one who looked on the crown as his by right, and who had crossed the sea to make his claim good. Then Englishmen stood armed in front of the great church; now the ground was held by Norman guards. Then there were Englishmen only who were to be asked if they approved the choice of the Witan; now there was a multitude of foreigners to whom the same question must be put in French.

The shout which gave the answer to this question was followed by a terrible tumult outside the walls of the church. The Norman soldiers stationed round the building set fire to the nearest houses, and gave themselves up to the work of plunder. Of the fact of the tumult there is no doubt. It emptied the church of all except the monks of the abbey and those who were taking part in the ceremony. The Norman portion of the congregation thought that the

inhabitants of London were risen against them in a body; the English feared that they were caught like wild beasts in a snare, and were to be the victims of a general massacre. It seems also certain that the Conqueror had nothing to do with the tumult. The prelates and clergy who remained with him to complete the rites were almost palsied with fear; and even William himself, we are told, trembled as he knelt before the high altar. The excuse given for the conduct of the Norman guards was that they took the acclamations of the crowd within the church for shouts of insurrection. The falsehood is manifest; for if they feared for the life of the king within the church, why, instead of hurrying to his defence, should they go off to plunder and destroy in another direction? Their fears were pretended; but the robbery and pillaging were real enough. It was, in fact, an outbreak of Norman soldiers against military discipline; and the words addressed by the Conqueror immediately after it to his barons seem to show that he himself regarded it as such. He told them that such conduct, if repeated, would madden the English into a general rebellion, and bring utter shame on themselves and on their country.

The English were now to see what manner of man he was whom they had chosen as their king; but it is very necessary for us to remember that, though William was a usurper, he received his crown as the elect of the people. A dark time of oppression was in store for his subjects; but the forms of freedom were not laid aside, and might hereafter again become realities.

Gems from the Poets.

JOHN MILTON.

1608—1674.

JOHN MILTON, son of John Milton, a scrivener, and Sara, his wife, was born at the sign of the Spread Eagle in Bread Street, Cheapside, London, on the 9th December, 1608. He was educated at St. Paul's School, and from thence he proceeded to Cambridge, where he was entered a student of Christ's College in 1625. He graduated B.A. in 1628, and proceeded to his M.A. degree four years later. From 1633 to 1638 he resided, devoting himself to study, at Horton, in Buckinghamshire. In the latter year he set out on a tour through Italy, during which he visited the principal towns of the country, and became acquainted with several Italians eminent in the world of art and letters. On his return to England he threw himself heart and soul into the struggle then raging between the Parliament and Charles I. In 1645 he published his Latin and English poems. After the death of Charles I. he was made Latin Secretary to the Commonwealth under Cromwell, and while engaged in this capacity

he wrote several prose works in defence of the principles espoused by his party. In 1652, his sight, weakened by an intense application to study, failed him, and in the same year his wife died. He married again in 1656, but his second wife survived the marriage little more than a year. Very soon the Commonwealth came to its end, and Milton, like many others, went into hiding. He lived in different parts of London for some years, but in 1663, the danger being over, and he having a third time married, took up his permanent residence in Artillery Walk, Bunhill Fields. He had been for some years engaged on three works, two of which were never completed. The third, probably finished at Chalfont St. Giles, in Buckinghamshire, whither he had removed to escape the Plague, in 1665, was published two years later, and was what is probably the finest of all epic poems, 'Paradise Lost.' He received ten pounds for this work, and his widow was paid an additional five pounds after some years. In 1671 was published his second epic, 'Paradise Regained,' and with it the dramatic poem of 'Samson Agonistes.' He was growing old now, and feeble, and in 1674, being sixty-six years of age, he died, and was buried in the church of St. Giles, Cripplegate. His chief poems, other than those mentioned, are 'Comus,' 'Lycidas,' the pastorals 'L'Allegro,' and 'Il Penseroso,' and the 'Nativity Hymn'; his best prose work, the treatise 'On the Liberty of the Press.' He was accomplished, handsome in person, and as a poet is surpassed by none but Shakspere.

J. S. FLETCHER.

EVENING IN PARADISE.

From *Paradise Lost.* Book iv.

Now came still evening on, and twilight gray
Had in her sober livery all things clad;
Silence accompanied; for beast and bird,
They to their grassy couch, these to their nests
Were slunk, all but the wakeful nightingale:
She all night long her amorous descant sung:
Silence was pleased: now glowed the firmament
With living sapphires: Hesperus, that led
The starry host, rode brightest, till the moon,
Rising in clouded majesty, at length,
Apparent queen, unveiled in peerless light,
And o'er the dark her silver mantle threw.
When Adam thus to Eve: 'Fair consort, the hour
Of night, and all things now retired to rest,
Mind us of like repose; since God hath set
Labour and rest, as day and night, to men
Successive; and the timely dew of sleep,
Now falling with soft slumb'rous weight, inclines
Our eye-lids: other creatures all day long
Rove idle, unemployed, and less need rest;
Man hath his daily work of body or mind
Appointed, which declares his dignity,
And the regard of Heaven on all his ways;
While other animals inactive range,
And of their doings God takes no account.
To-morrow, ere fresh morning streak the east
With first approach of light, we must be risen,
And at our pleasant labour, to reform
Yon flowery arbours; yonder alleys green,
Our walk at noon, with branches overgrown,
That mock our scant manuring, and require
More hands than ours to lop their wanton growth:
Those blossoms also, and those dropping gums,
That lie bestrewn, unsightly and unsmooth,
Ask riddance, if we mean to tread with ease;
Meanwhile, as nature wills, night bids us rest.'
To whom thus Eve, with perfect beauty 'dorned:
'My author and disposer, what thou bidd'st
Unargued I obey: so God ordains;
God is thy law, thou mine: to know no more
Is woman's happiest knowledge, and her praise.
With thee conversing, I forget all time;
All seasons, and their change, all please alike.
Sweet is the breath of morn, her rising sweet,
With charm of earliest birds; pleasant the sun,
When first on this delightful land he spreads
His orient beams, on herb, tree, fruit, and flower,
Glistering with dew; fragrant the fertile earth
After soft showers; and sweet the coming on
Of grateful evening mild; then silent night,
With this her solemn bird, and this fair moon,
And these the gems of heaven, her starry train:
But neither breath of morn, when she ascends
With charm of earliest birds; nor rising sun
On this delightful land; nor herb, fruit, flower,
Glistering with dew; nor fragrance after showers;
Nor grateful evening mild; nor silent night,
With this her solemn bird: nor walk by moon,
Or glittering star-light; without thee is sweet.'

FROM THE NATIVITY HYMN.

* * * * *

But peaceful was the night
Wherein the Prince of Light
His reign of peace upon the earth began:
The winds, with wonder whist,
Smoothly the waters kiss'd,
Whispering new joys to the mild ocean,
Who now hath quite forgot to rave,
While birds of calm sit brooding on the charmed wave.

The shepherds on the lawn,
Or ere the point of dawn,
  Sat simply chatting in a rustic row;
Full little thought they then
That the mighty Pan
  Was kindly come to live with them below:
Perhaps their loves, or else their sheep,
Was all that did their silly thoughts so busy keep.

When such music sweet
Their hearts and ears did greet,
  As never was by mortal finger strook;
Divinely-warbled voice
Answering the stringèd noise,
  As all their souls in blissful rapture took
The air, such pleasure loth to lose,
With thousand echoes still prolongs each heavenly close.

* * * * *

Such music (as 'tis said)
Before was never made,
  But when of old the sons of morning sung
While the Creator great
His constellations set
  And the well-balanced world on hinges hung;
And cast the dark foundations deep,
And bid the weltering waves their oozy channel keep.

Ring out, ye crystal spheres,
Once bless our human ears,
  If ye have power to touch our senses so;
And let your silver chime
Move in melodious time;
  And let the bass of heaven's deep organ blow;
And, with your nine-fold harmony,
Make up full concert to the angelic symphony.

For, if such holy song
Enwrap our fancy long,
  Time will run back and fetch the Age of Gold;
And speckled vanity
Will sicken soon and die,
  And leprous sin will melt from earthly mould;
And hell itself will pass away,
And leave her dolorous mansions to the peering day.

Yea, Truth and Justice then
Will down return to men
  Orb'd in a rainbow; and, like glories wearing,
Mercy will sit between,
Throned in celestial sheen,
  With radiant feet the tissued clouds down steering;
And Heaven, as at some festival,
Will open wide the gates of her high palace-hall.

Up our Rivers.

II.—THE SEVERN.

ON the western side of England, directly opposite the Thames, is the mouth of the river up which we purpose taking an imaginary trip this month.

This is the Severn, a stream 220 miles long, and consequently longer than the first-mentioned river by about ten miles.

Its mouth is very long and wide—larger, in fact, if we include the Bristol Channel as part, than that of any other river in Great Britain—and since it opens directly in to the Atlantic, its waters are often extremely rough and dangerous.

From its funnel-shaped form the tide runs up with great force and velocity, sometimes in the shape of a noisy, dashing wave, four or five feet high, forming the phenomenon called the *bore* or *egre*.

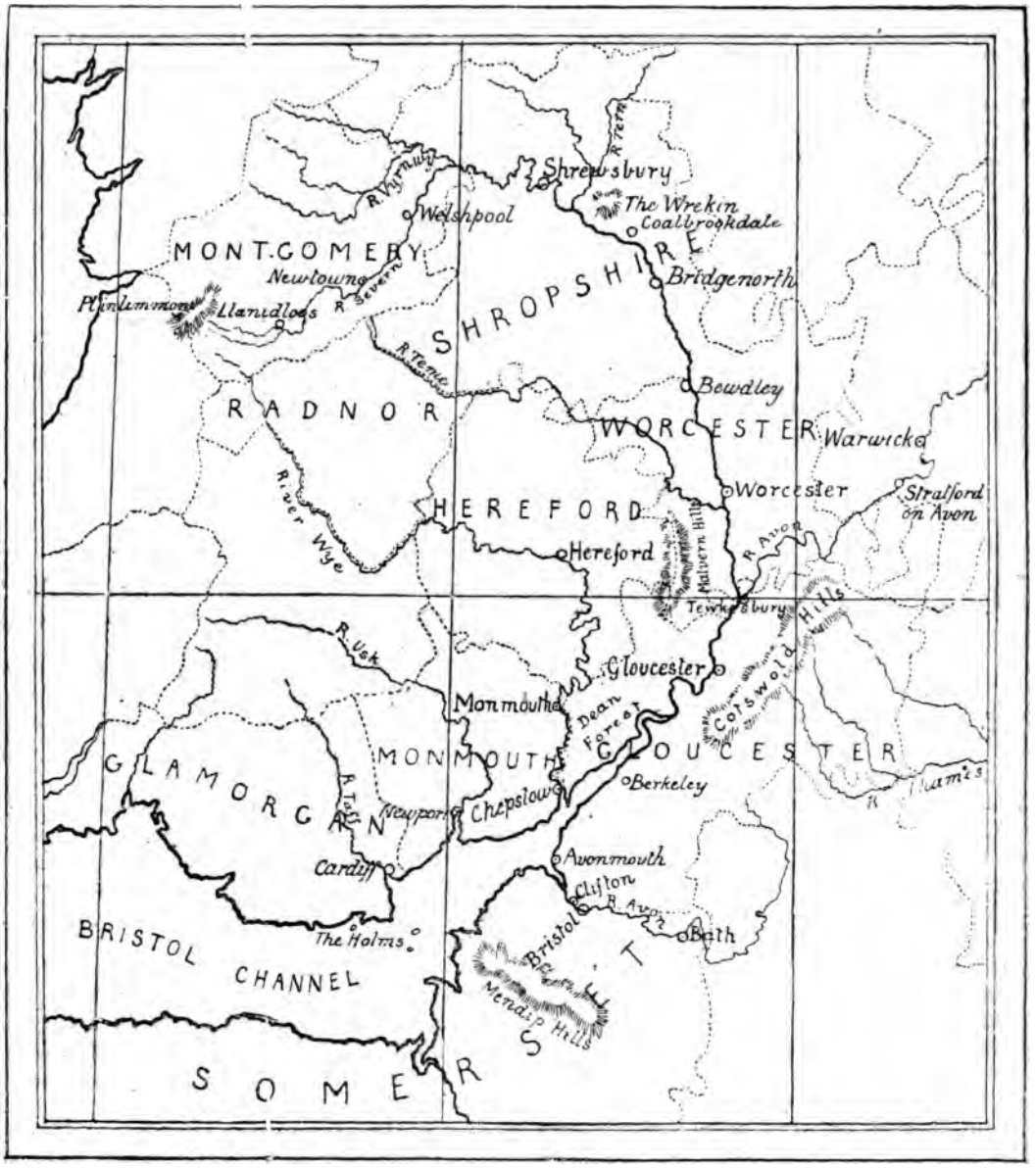
Commencing our journey at the Flat and Steep Holms, two small islands lying in mid-channel between Somersetshire and Glamorgan off Weston-super-Meare, we proceed up stream in a north- asterly direction. We soon leave behind us the busy port of Cardiff, with its castle in which Robert of Normandy was confined for twenty-eight years by his brother, King Henry I.

We next see the well-frequented watering-place, Clevedon, on the coast to the right, opposite which, on the northern side of the river, the Usk pours its waters into the main stream.

Portishead then shows itself on the south, and a few miles more bring us to Avonmouth, a town which derives its name from its position at the mouth of the Lower Avon, the river on which Clifton, Bristol, and Bath are situated. Seven or eight miles more, we come to the old-fashioned town of Chepstow, situated at the mouth of a river said to be the prettiest in Britain —the Wye. The tide here sometimes rises to the astonishing height of sixty feet above low-water level.

From thence onwards for many miles we have Gloucestershire on both sides of us. The Forest of Dean, celebrated for its iron and coal mines, lies on our left, while on the right, after coming almost within sight

of Berkeley Castle, in which Edward II. was cruelly murdered, we pass Newnham, miles further up, the high-spirited Margaret, wife of Henry VI., was defeated by



and arrive at Gloucester, just opposite which the little river Leddon joins the main stream.

Near Tewkesbury, a town about fifteen Edward IV. in 1471; and at the same town, too, the Severn receives from the east the Upper Avon, a stream celebrated not so much for its size or beauty, as for its

flowing through Stratford, the birthplace of Shakspere.

We now enter Worcestershire, catch a glimpse of the Malvern Hills on the west, and after passing the point at which the Teme joins us, come to the county-town Worcester. Here, on September 3rd, 1651, occurred that memorable battle in which Cromwell utterly defeated Charles II., and gained what he was wont to call his 'crowning mercy.'

After passing the mouth of the Stour, and the town of Bewdley, we enter Shropshire, and soon come to Bridgenorth, a quaint old town, built on the face of a steep slope, and celebrated for the manufacture of carpet. For some miles our course then lies through a district devoted to the iron and coal industries, almost in the centre of which, amid the hilly and picturesque scenery of the Wrekin, is the town of Colebrookdale. We next pass the mouth of the Tern, which flows in on our right, and reach Shrewsbury, the county town of Shropshire, near which, in 1403, Henry Percy, surnamed Hotspur, was defeated and slain whilst fighting against Henry IV.

The next and last county we enter is Montgomery, and our course is, generally speaking, towards the south-west. We are now in the great flannel and blanket-making district of Wales, and the two chief towns we pass, Welshpool and Newtown, are both engaged in the trade.

The river-valley here rapidly narrows, and our course lies amidst the Welsh hills.

At Llanidloes we come to the junction of the two streams—the Havren and the Clewedog—which, when united, form the Severn.

Both these streams, and also the Wye, take their rise within a short distance of each other among the great spurs of the mountain Plinlimmon in the south-west of Montgomery.

SUMMARY.

Source	Plinlimmon, in Montgomery.
Course	First east, then south, then west.
Length	220 miles.
Counties through which it flows ...	Montgomery, Shropshire, Worcestershire, Gloucestershire, and between Monmouth and Somerset.
Tributaries on Right Bank	Teme, Leddon, Wye, and Usk.
Tributaries on Left Bank	Vyrnwy, Tern, Stour, Upper Avon, Lower Avon.
Towns on its Banks	Llanidloes, Newtown, Welshpool, Shrewsbury, Colebrookdale, Bridgenorth, Bewdley, Worcester, Tewkesbury, Gloucester, Chepstow, Avonmouth, Portishead, Clevedon Newport, and Cardiff.

Arithmetic. STANDARD III.

A. 1. (671,439 × 68) ÷ 16.
2. (518,317 − 9088) ÷ 25.
3. (9,220,140 ÷ 12) ÷ 708.

B. 1. Divide nine hundred and five thousand and twenty by 83.
2. Divide 71,680,429 by 9085.
3. Take £467 8s. 4½d. from £5000.

C. 1. Add together twenty thousand pounds and ninepence, £316 18s. 3½d., fifty-one thousand and three pounds, fourteen shillings and a farthing, 17s. 9½d., £8491 12s. 6¾d., and eleven guineas and tenpence.
2. Divide 417,608,231 by 87,060.
3. From £600 take 1s. 2¾d.

D. 1. Five millions and twenty ÷ 79,603.
2. Take 4179 pence from £50.
3. Add 2 to 999,599, and write the answer in words.

E. 1. How many threepences are there in 91,783 guineas?
2. Add together 5 each of all our *silver* coins.
3. How much are £786, 4117 crowns, 917 fourpences, and 5171 twopences?

F. 1. In dividing by 256, a boy got a remainder of 389,—what ought to have been the remainder?
2. 817,391 farthings − 3867½ flors.
3. 91,782,349 ÷ (6489 × 16).

ADVANCED EXAMINATION.

1. Take seven million three thousand and sixteen farthings from 87,041 half crowns. Ans. in £ s. d.
2. Out of £20 a man bought a cow for £15 16s. 8d., two pigs at £1 17s. 9d. each, and 3 ducks at 2s. 3d. each. He then spent the remainder in oranges at three a penny;—how many oranges did he get?
3. An ewe and her two lambs are worth £6 12s. 6d., and the ewe is worth four times as much as each lamb;—what is each lamb worth?

STANDARD IV.

A. 1. £876 14s. 8½d. × 25.
2. £980 16s. 0¾d. × 84.
3. £4183 17s. 10½d. ÷ 18.

B. 1. Multiply £78 14s. 9¾d. by 121.
2. Take £6841 14s. 0½d. from £83,468 17s. 2½d., and divide the remainder by 69.
3. How many seconds are there in this year—1882?

C. 1. £93,801 14s. 8¾d. ÷ 209.
2. £49 17s. 2¾d. × 208, and bring the product to pence.
3. Bring nine million eleven thousand and fourteen ounces to tons, cwt., etc.

D. 1. What would 720,000 marbles cost, at 7½d. a gross?
2. £64,793 14s. 8½d. ÷ 93,008.
3. How many inches are there in 58¾ miles?

E. 1. Multiply 16s. 2½d. by 10,051.
2. Find the value of 20 bales of linen, each bale containing 64 pieces, and each piece measuring 84 yards, at 1s. 1½d. a yard.
3. Which is the middle day in a calendar year of 365 days?

F. 1. Bring 628 tons 14 cwt. 3 qr. 18 lbs. to drams.
2. If books are 2s. 7½d. each, how many could be bought for 286¾ guineas?
3. How many square feet are there in 2½ square miles?

Advanced Examination.

1. A man bought 5000 oranges for £10, part of which being unsaleable, he sold the remainder at 9d. a dozen, and gained only £2 by them. How many oranges were unfit for sale?

2. If a cubic inch of cheese weigh ¾oz., find the value at 8d. a lb. of 160 cheeses, each containing 1 c. ft. 216 c. in.

3. Find the continued product of 2¼d. by 604, 804, and 1004.

STANDARD V.

A. 1. 9287 knives at 4½d. each.
2. 7163 ,, 9¾d. ,,
3. 7905 ,, 2s. 2½d. ,,

B. 1. 81735 maps at 3s. 5½d. each.
2. 8649 ,, 15s. 1¾d. ,,
3. 76805 ,, £3 3s. 8½d.,,

C. 1. 9168 articles at 16s. 9½d. each.
2. 8471½ ,, £5 17s. 5d. ,,
3. 9483¾ ,, £16 12s. 9d. ,,

D. 1. 28 ton 16 cwt. 3 qr. 14 lb. at 11s. 8d. a ton.
2. 68 yds. 3 qr. 3 nl. at 8s. 3d. a yd.
3. If 28 oranges cost 10d., how many could be bought for 5s. 7½d.?

E. 1. 65 ac. 3 r. 28 per. at £68 12s. an acre.
2. 203 qr. 3 bu. 2 pk. at £2 18s. a qr.
3. If 30 men excavated a tunnel in 80 days, how many additional men would have been required to have done it in 50 days?

F. 1. Four is to 11 as 200 is to a certain number:—What is the number?
2. Find the value 7 ton 13 cwt. 1 qr. 18 lb. of sugar at 24s. 8d. a cwt.
3. If 3½ cwt. of coal cost 2s. 10½d., what would 140 ton cost?

Advanced Examination.

1. Head, arrange neatly, calculate, and receipt the following bill:—13⅜ yds. of silk at 5s. 9d. a yd.; 281½ yds. of calico at 4¼d.; 6¼ yds. of velvet at 17s. 3d.; 72¼ yds. of linen at 1s. 3½d.; and 1⅛ yds. of crape at 4s. 6d.
2. Divide £13 10s. among 6 men, 8 women, and 12 boys, so that a man may receive twice as much as a woman, and a woman three times as much as a boy. What will each receive?
3. Find the value of 315 sq. yds. 6 sq. ft. 60 sq. in. of paving at 2s. 9d. a sq. yd.

STANDARD VI.

A. 1. $\frac{5}{8}+2\frac{1}{2}+\frac{3}{8}$ of $6\frac{1}{4}$.
2. 5s. 6½d. is $\frac{5}{17}$ of what sum of money?
3. $\frac{3\frac{1}{4}}{8\frac{3}{4}}$ cr. to frac. of guinea.

B. 1. $(314{\cdot}08-83{\cdot}0935)\div{\cdot}05$
2. Bring 19s. 8½d. to dec. of £4,000.
3. If 2·35 lb. of sugar cost ·65s., what will 100 lb. cost?

C. 1. If 25 men do a piece of work in 28 days of 8 hours each, in how many hours a day for 21 days would 30 men have done it?
2. If 7 cats, put into a barn for 3 hours, catch 168 mice, how many would 35 cats catch in 1½ hours, the game being equally abundant?
3. What would 6 ton 13 cwt. of coal cost, if 20 ton cost £11 13s. 6d.

D. 1. Divide $\frac{4\frac{3}{5}}{10\frac{3}{5}}$ by $\frac{7\frac{1}{2}}{12\frac{5}{8}}$.
2. $(\cdot0625\times200{\cdot}15)\div12500$
3. How many 6-lb. loaves would 80 men eat in 50 days if 40 women ate 70 5-lb. loaves in 6 days, 2 men requiring as much bread as 3 women?

E. 1. What would 2·175 cwt. of sugar cost at ·025 of 12s. 6d. a lb.?
2. A can mow an acre of grass in 8 hours and B in 10. In how many hours could they together mow 1¼ acres?
3. $(8{\cdot}1-{\cdot}015+{\cdot}35)\div(3{\cdot}85\div{\cdot}004)$

F. 1. Simplify $(13\frac{1}{2}-9\frac{3}{4})\div(6\frac{3}{4}+8\frac{7}{8})$.
2. Bring $\frac{5}{8}$ of ·01785 crown to the v. f. of a guinea.
3. If $3\frac{3}{5}$ ton of coal cost $£2\frac{1}{16}$, what fraction of a cwt. could be bought for 2¼d.?

Advanced Examination.

1. A lady visits three shops consecutively, spending ⅔ of her money at the first shop, then ¾ of the remainder at the second, and ⅔ of what she then had left at the third shop. She reaches home with £1 12s. left. How much had she at starting?
2. $\frac{6\frac{1}{4}-1{\cdot}085}{8{\cdot}15\times2\frac{7}{13}}\times\frac{6{\cdot}35-2\frac{7}{8}}{10\frac{3}{8}\div9{\cdot}15}$
3. A contractor undertook to make an embankment 1,000 yards long in 40 days, employing 60 men 10 hours a day; but at the end of 30 days he finds that only 680 yards are done. How many hours a day, with 12 additional men, must they now work to complete the embankment in the given time?

STANDARD VII.

A. 1. Divide ·085 of £17 17s. 6d. among 120 boys;— What v.f. of half-a-crown will each get?
2. Simple interest of £622 10s. for 3½ years at 5 per cent. per annum?
3. At what rate per cent. would £525 amount to £600 in 3¾ years?

B. 1. Of 10 boys standing in a group, 2 of them have 50 marbles each, 4 have 35 each, 3 have 30 each, and one boy has none;—What is the average for each of them; that is, supposing the whole were equally divided among them, how many would each get?
2. How much is $\frac{2}{3}$ of $\frac{4}{5}$ of $\frac{5}{6}$ of $1\frac{1}{2}$ of $2\frac{2}{3}$ of $3\frac{1}{5}$ of £120?
3. In how many years would £480 amount to £535, at 4½ per cent.?

C. 1. Find sq. root of 33,709,636.
2. £35 made 6s. 3d. interest in 55 days;—what was the rate per cent. per annum?
3. A man bought a horse for £35 and sold him for £40;—what did he gain per cent. on his outlay?

D. 1. What principal would amount to £650 in 4 years at 4½ per cent. simple interest?
2. What principal would amount to £650 in 3 years at 5 per cent., *compound* interest?
3. Find cube root of 18,609,625.

E. 1. Find the premium for insuring a building worth £8762 10s. at 2s. 6d. per cent.?
2. Bacon was bought at £45 a ton;—what must it be sold at per lb. to gain 30 per cent.?
3. Give the exact date of 201,683 minutes reckoned forward from March 4th at 6.50 p.m.

F. 1. Find simple interest of £745 12s. for 219 days at 3 per cent.
2. Find compound interest of £875 for 4 years at 4 per cent.
3. A person who owns $\frac{3}{64}$ of a ship receives £281 5s. as his year's dividend, being at the rate of 7½ per cent. on the value of the ship;—what is the ship worth?

ADVANCED EXAMINATION.

1. A and B can do a piece of work in 10 hours, B and C in 12, and A and C in 15 hours;—in what time could they altogether do the work, and in what time could C do it alone?

2. A person invested £4000 in £20 bank shares, for which he paid £25 per share. The dividend is 6¾ per cent. on the original or nominal value of the shares. What amount will he receive on his investment, and what rate of interest per cent.?

3. By selling hats at 10s. 6d. each 15 per cent. is gained on the prime cost,—what would be the gain per cent. if they were sold at 12s. each?

Algebra.

BY W. H. HARVEY, B.A. (LONDON).

Factors.—When an expression is the *product* of two or more quantities, each of these quantities is called a *factor* of the expression:

thus $7abc = 7 \times a \times b \times c$,

wherefore 7, a, b, and c are the factors of $7abc$.

Coefficient.—Each of the factors of an expression is called a *coefficient* of the product of the remaining factors: thus, in the above expression $7abc$, 7 is coefficient of abc, a of $7bc$, b of $7ac$, and c of $7ab$.

The factor expressed arithmetically at the commencement of the expression (viz. 7), is distinguished as the *numerical coefficient*; while the others, expressed algebraically, as a, b, c, are termed *literal coefficients*.

NOTE.—If no *numerical coefficient* be expressed, the figure 1 must be understood: thus, abc means $1abc$.

EXERCISE II.

(1.) What are the *elementary factors* of $72a^3b^2c$?

(2.) What are the *numerical coefficients* of $17a^2b$, and $\frac{3a^2c}{2}$?

(3.) What are the *coefficients* of a in $10abc$, and $15a^2bc$?

Power.—When we multiply one quantity by *another* the result is called a *product*.

When, however, we multiply a quantity by *itself*, the product obtained has a particular name given to it—viz., *power*.

Thus $a \times b$ is simply the *product* of a and b.

But $a \times a$ is called a *power* of a.

These *powers* have different names according to the number of times the quantity occurs as a factor in them.

Thus a is called the First Power of a.

$a \times a$ (written a^2) is called the Second Power (or Square) of a.

$a \times a \times a$ (written a^3) is called the Third Power (or Cube) of a.

$a \times a \times a \times a$ (written a^4) is called the Fourth Power of a, and so on.

NOTE.—a^2 is read *a squared*.
a^3 ,, *a cubed*.
a^4 ,, *a to the fourth power*, etc.

Index.—The small figure (such as the 2 in a^2, the 3 in a^3) placed above the quantity, to show how often it occurs as a factor in the product, is called the *Index* or *Exponent*.

It will thus be seen that an expression like $7a^3b^4c^3$ is simply a short way of expressing *7aaabbbbccc*, and that if we wish to find the numerical value of such an expression (see Question 10 in Exercise iii.) we have only to substitute for a, b, and c, their respective values, and multiply them together.

EXERCISE III.

(1) Express in full the meaning of $6a^3b^4c$, and x^2y^3z.

If $a=1$, $b=3$, $c=5$, $d=7$, and $x=0$, find the value of

(2) $a^2 + b^2 + c^2$.

(3) $a^2 - b^2 + c^2$.

(4) $2a^2 + 12b^2 - c^2$.

(5) $a^2b + ac^2$.

(6) $\frac{ab^2c}{d} + \frac{3a^2c}{b}$

(7) $\frac{2a^3 + ab^4 + a^2c}{3ad - bc}$

(8) $a^3 - 3a^2c + 3bc - x^2$.

(9) $ab + cb - xc$.

(10) $9a^5b^2c^3$.

(11) Find the area of a rectangular field $a + b^2 + c^3$ feet long, and $7a^2b^2c$ feet wide.

(12) What is the 4th power of $6a$?

Brackets.—We have before mentioned that in Algebra, as in Arithmetic, brackets serve to connect and make one of all the quantities contained in them. In other words, *all* that is contained in the bracket is to be regarded as *one* quantity.

The forms most usually employed are (.....), {.....}, [.....], and also a simple line drawn over the terms to be connected (called a *vinculum*, plural *vincula*), as, $\overline{a+b+c}$.

Before working the examples in the following exercise, attention must be paid to these rules.

I.—When an expression within brackets is preceded by the sign +, the bracket may be removed without altering any of the signs thus, $a+(b+c)+d=a+b+c+d$.

II.—When, however, the bracket is preceded by the sign −, it can only be removed by changing the sign of every term it contains, + into −, and − into +.

Thus, $a-(b+c)+d=a-b-c+d$.

EXERCISE IV.

Remove the brackets from the following:—

(1) $a+(b+c)+(d+e+f)$.

(2) $a-(b+c)-(d+e+f)$.

(3) $7+(5-6+7)-(3-6+1)$.

NOTE.—In the following, remove the inner brackets first, and then proceed as in this example.

$$\begin{aligned} &a-[b-\{c-(d-e)+f\}] \\ =&a-[b-\{c-d+e+f\}] \\ =&a-[b-c+d-e-f] \\ =&a-b+c-d+e+f. \quad \text{Ans.} \end{aligned}$$

(4) $a+\{b-(c+\overline{d-e+f})\}$.

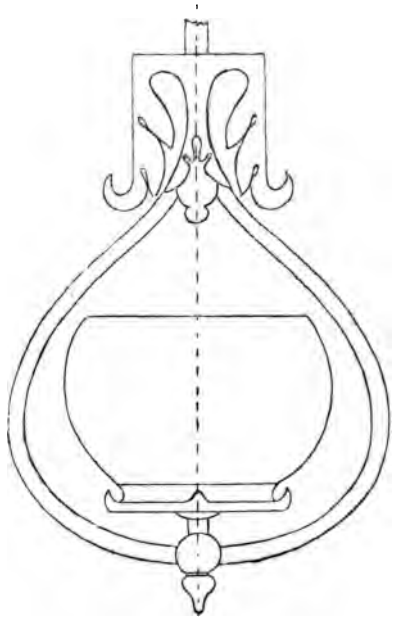
(5) $a-[b+c-\{d+e-(\underline{f-g})\}]$.

(6) $a^2-\{bc+(c-de)\}-f+g$.

(7) $a^2-[b^2-\{c^2-(bc-g)-h\}]$.

(The Answers to the Arithmetic and Algebra appear in the April number of the *Practical Teacher* and the *Governess*).

Freehand Drawing Copies.



The Pith of a Course of Domestic Economy Lessons.

BY MRS. WIGLEY,
Author of 'The Marshfield Maidens,' etc.

LESSON V.

A SECOND thing which food has to do is to supply the daily waste.

You know that everything wears out in time. And you also know that the more things are used, the faster they wear away. No matter how thick the sole of your boot may be at the beginning, it will wear thinner and thinner every day you put it on, and if you do not mend it, it will soon be gone altogether. It is so with everything else. A stone wall will wear and crumble away only by the action of the weather upon it. If we are vigorous and active our bodies wear away very fast. Then why do we not altogether disappear? Why does not the heel of our fleshy foot, which is not nearly so tough as leather, wear away as our boot wears away? Because there is a something which is continually making good the daily wearing out of our muscle or flesh, which grows another little bit for every tiny portion which has worn off. And this something is the food we eat. Now you know of two kinds of work which food has to do: it has to keep up the proper degree of heat, and to supply the daily waste.

LESSON VI.

BUT there are other parts of our bodies which require nourishment besides our flesh. What about our bones and hair and nails? You know how much we use the arm bone, which is fixed in a socket. Now you may make a joint of iron and fix it in a socket, and yet before you have kept it in constant use very long it will become loose or shaky, and by-and-by it would wear through or break. But your joints, though not nearly so strong as iron, do not get loose—they work as easily, and your bones are even larger and stronger than they were a year ago; and it is the food you have eaten which has kept them in good condition and enabled them to grow larger as you grow older. And the same thing happens with your hair and nails; there is no long hair growing deep down through your body, which by degrees comes out. Only the root of the hair is in the skin, but something is supplied by your food to that root, and this nourishes the hair and keeps it growing, just as water nourishes a plant.

Now you know the three different kinds of work which our food has to do in our bodies.

1. Food must produce and regulate the necessary warmth of the body.
2. It must supply the daily waste to muscle or flesh.
3. It must keep the bones, nails, etc., in good repair.

LESSON VII.

IF you think of the different kinds of work to be done in the body you will know at once that the same kind of food will not do it all. We must have food suited to the work it has to do. That which will make flesh is not suitable for making bones. So you will readily understand that for three kinds of work we must have three kinds of food. And so we have:—

First, we have the foods that give warmth, which are called *Carbonaceous*.

Second, we have the foods that make flesh, which are called *Nitrogenous*.

Third, we have the bone-making foods, which we call *Mineral foods*.

Now there are three kinds of Carbonaceous foods:—

1. The starchy or floury foods which we get from the grain plants, wheat, rice, maize, and also from potatoes, peas, and beans. These foods are called Farinaceous foods.
2. The fatty foods, such as flesh, milk, butter, and cheese. These are called Oleaginous foods.
3. Sugar. This we get from vegetables, such as the sugar-cane and fruits. Such foods are called Saccharine, or sweet foods.

So there are three kinds of Carbonaceous food, Farinaceous, or floury, Oleaginous, or fatty, and Saccharine, or sweet foods.

LESSON VIII.

NITROGENOUS foods, or those which make flesh, are as follows:—

1. *Fibrine*, which is the fibre of all flesh foods.
2. *Gluten*, which is a sticky substance found between the husk and kernel of all the grain plants.
3. *Albumen*, the substance which forms the white of an egg, and which is also found in flesh foods.
4. *Caseine*, which is the solid part of milk, called curd, and from which we make cheese.
5. *Legumin*, a substance very like caseine, which is found in peas and beans.
6. *Gelatine*, which is procured from bones and from fish.

Our mineral foods are supplied in these ways:—

1. By water, in which there is lime, or iron, or potash.
2. By fresh vegetables, in which there is potash and soda.
3. By common salt.

Our principal mineral foods are salt, soda, potash, and lime.

THE TRAVELLING TINKER.

Words by GEO. BENNETT. *Music by* T. CRAMPTON.

Lively.

1st TREBLE.
2nd TREBLE.
BASS.

1. A-ny knives, now, or scis-sors, to grind? A-ny saucepans or ket-tles want mending? A-ny brok-en um-

KEY A. *Lively.*

1st TREBLE.
2nd TREBLE.
BASS.

: s₁.s₁ | s₁ :d :d | r :d :t₁ | d :-:-|-:-:d.d | r :r :r | r :m :f | f :m :-| : :s₁.s₁ | s₁ :m :m
: m₁.m₁ | m₁ :m₁ :m₁ | f₁ :m₁ :r₁ | m₁ :-:-|-:-:s₁.s₁ | t₁ :t₁ :t₁ | t₁ :d :r | r :d :-| : :m₁.m₁ | m₁ :s₁ :s₁
: d .d | d :d :d | s₁ :s₁ :s₁ | d₁ :-:-|-:-:m₁.m₁ | s₁ :s₁ :s₁ | s₁ :s₁ :s₁ | d :d :-| : :d .d | d :d :d

brel-las? you'll find We'll make them worth us-ing or lend-ing: Then, bring 'em out now, and we'll show Our

s.d.f. E.

words are as true as the di-al— We're trust-y and quick, as you'll know, If you on-ly give us a tri-al.

CHORUS. *f*

While round go the wheels and the stones, With a spar-kle, a hiss, and a rum-ble: Oh, the tin-ker's a man who

A. l.m.t. CHORUS. *f*

Symph.

earns what he can, And if he's but paid, he don't grum-ble!

Symph.

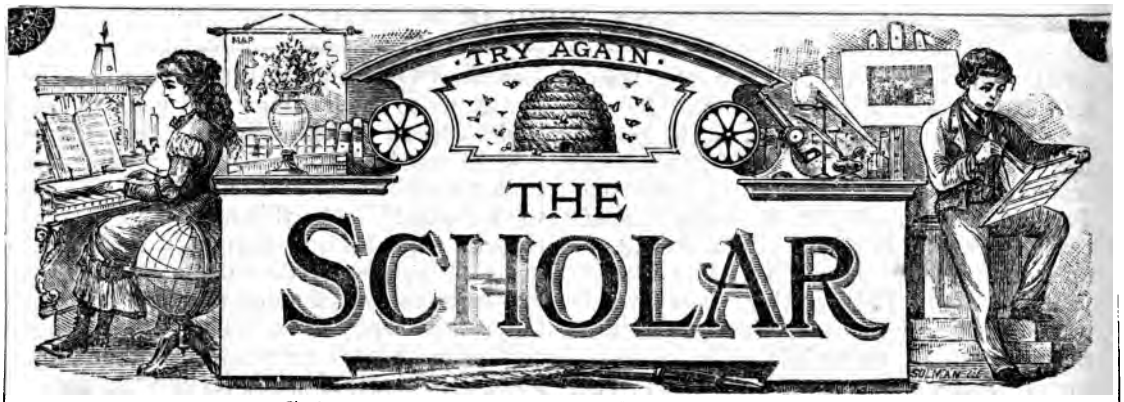
2. "It is never too late to mend"
Is a proverb as old as your granny;
Then don't grudge the trifle you spend,
And fancy you might be more canny:
Your knives we'll make better than new—
Good tinkers are always painstaking;
We'll charge you but little, and you
The best of the bargain are making.
While round, &c.

3. Any razors to grind or to set?
We'll fettle them up as requested;
So sharp, that a hair they would split,
Or barber a hedgehog, if tested!
We're grimy—but that's the trade mark;
You'd think we weren't tinkers without it:
But off goes the lathe now—and hark!
Your job we'll be speedy about it.
While round, &c.

We very much regret that owing to the pressure on our space the Dictionary is this month unavoidably omitted. (Ed. S.)

For full particulars of the 'Scholar's' Writing Competition, see No. 1 of 'The Scholar.'

'The Answers to the Arithmetic and Algebra in No. 2 of 'The Scholar' may now be had, on Stout Card, Price 1d.
A dozen Answer-cards sent to TEACHERS ONLY on receipt of 8d. in stamps.



A Monthly Educational Paper for School and Home.
Conducted by JOSEPH HUGHES.

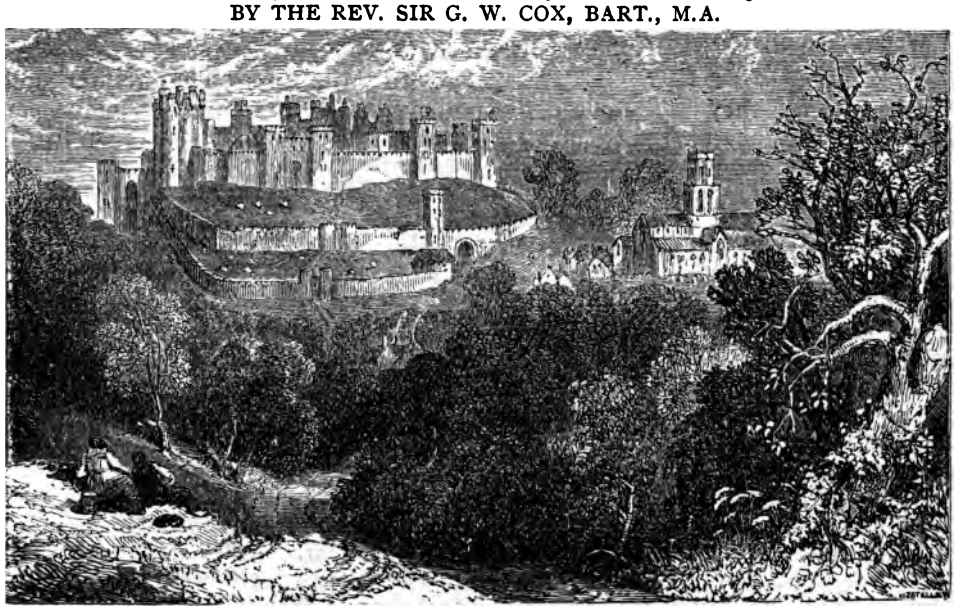
No. 3. Vol. I. MAY, 1882. [Price ½d. Per post, 13 copies for 7½d.

CONTENTS.

1. Stories from English History 25
2. Gems from the Poets 27
3. Dictionary 29
4. Up our Rivers.—III. The Trent. With Map 30
5. Algebra 31
6. Freehand Drawing Copies 32
7. Arithmetic for Standards III., IV., V., VI., VII. .. 33
8. Domestic Economy 35
9. Music 36

Stories from English History. 3.—Richard II. and the Men of Kent.

BY THE REV. SIR G. W. COX, BART., M.A.



PONTEFRACT CASTLE IN THE SEVENTEENTH CENTURY.

THE citizens of London had promised to open the gates of the city to the men of Essex, if they would come and lay their wrongs before King Richard, who was now a lad fourteen years of age. Both citizens and peasants thought that he would do

[ALL RIGHTS RESERVED]

what they wanted according to the laws, and both hoped that there would be no need of any violence. But such movements are often hurried on in an unforeseen way; and so it was now. In 1381 the Parliament decreed that a yearly tax of twelve pence should be levied on every one, man and woman alike, after fifteen years of age. This poll-tax was levied with due decency on the powerful and the rich; it was not so levied in the houses of the poorer sort, and at Dartford a tiler smote down a tax-gatherer who dared to ill-treat a child whom her mother declared to be under the taxable age. The men of Western Kent now rose in rebellion, and at Maidstone they made Walter the tiler, commonly known as Wat Tyler, their leader. When they reached Blackheath their host is said to have numbered a hundred thousand men. To this vast multitude John Ball preached a sermon, taking for his text the couplet—

> 'When Adam delved and Eve span,
> Where was then the gentleman?'

They had come, they said, to see the king, and by him they looked to have all their wrongs set right. On their march to Blackheath they had made prisoner a knight and his two sons. They kept the sons as hostages, and sent the knight to King Richard to tell him that they must see him, as they had that to say to him which they could not say through another. The Archbishop of Canterbury advised him to have nothing to do with shoeless scoundrels; but the king bade the knight tell the people that if they would on the next morning come to the bank of the Thames he would there speak with them. At the fixed time the royal barge approached the shore. 'Here I am,' said the king; 'what do you want?' 'We want you to come ashore, and then we will tell you the answer.' Here the Earl of Salisbury broke in, 'You are not fitly ordered or rightly clad for the king's presence.'

The barge shot back towards the Tower of London. On seeing this, the troop which had come to the Thames went back to the multitude at Blackheath, and told them how things had gone. At once the cry rose, 'To London! to London! Let us go to London!' On this march, as in the march to Blackheath, they used some violence. They destroyed some manor-houses; but they took no plunder, and for all food they scrupulously paid. The gates of the city were thrown open at their demand, and after satisfying their hunger, they rushed to the Savoy, the palace of the Duke of Lancaster, whom they hated as one of the worst of their oppressors. To this they set fire, but they took nothing for themselves, and one man who was found with a silver cup hidden in his coat was thrown with the cup into the Thames.

The next morning they declared that if the king would not come out to meet them they would storm the Tower, and kill all whom they found within it. The king sent a message to say that he would not fail to meet them if they would leave the city and go to Mile End. The greater number obeyed; but no sooner, it would seem, had he left the Tower than a body of the insurgents forced their way in, seized the Archbishop of Canterbury and put him to death, with two or three others.

Meanwhile, Richard had reached Mile End, and there, riding boldly forward, he said, 'Good people, I am your king; what do you want?' 'Our freedom,' they shouted: 'freedom for ourselves, our children, and our goods. We will not be called serfs any more, nor will we live in bondage.' 'I grant it,' answered the king. 'You shall forthwith have letters under my seal which shall secure to you all that you have asked. I pardon all that you have done thus far. Go quietly to your homes.'

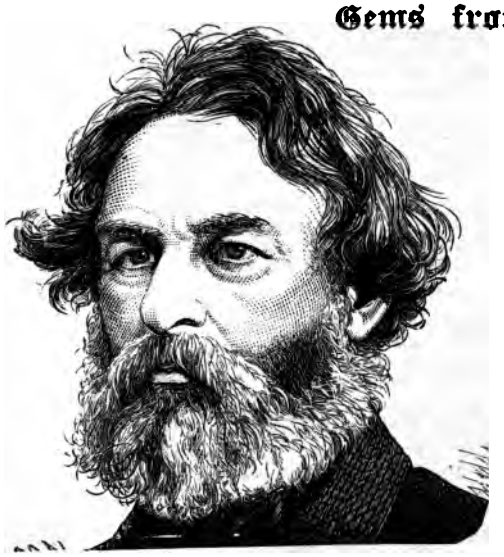
The letters were written, were signed, sealed, and sent to the envoys of the insurgents, who went, leaving Wat Tyler, John Ball, and others, who said that they would not depart until they had better surety of the good faith of the king.

Richard agreed to meet them in Smithfield. He came to them attended by the Lord Mayor, Sir William Walworth, and a guard of nobles and knights, and sent a messenger to say that the leaders of the people had nothing to do but to come and tell him of their grievances. Wat Tyler advanced alone, and with scant courtesy, perhaps, laid the demands of the peasants before the king. The story tells us that while he spoke he held his hand on his dagger, and that when he seized the bridle of the king's horse, the Lord Mayor stuck a short dagger into his throat, that he rode off a few yards, fell, and was immediately murdered (1381).

Then followed the scene in which Richard is said to have displayed such marvellous courage. On the one side we have the peasants crying out, 'They have slain our leader. Let us kill them all;' on the other we have the young king riding up to them and saying, 'I am your leader, I am your king; follow me, and I will give you all that you ask for.' The glory of his courage is somewhat dimmed if, as seems likely, the words were uttered only to deceive and cheat the insurgents. That Wat Tyler should go forward alone, if he intended to do the king any harm, is past all belief. It is also certain that Richard broke his pledged word, and revoked the charters which he had signed and sealed, rivetting the chains which by his solemn promise were to be broken for ever.

Some twenty years later the evil days came upon Richard, not from the wrath of peasants, who had no one to speak for them, but from a Parliament whose control he had sought to shake off. He was still in the bloom of early manhood, when the national council solemnly declared him to be degraded from the state and authority of king, as having notoriously deserved that punishment. Nor did the likeness of his lot to that of his great-grandfather end here. The midnight slaughter in Berkeley Castle was repeated in that of Pontefract. Of the manner of his death we have no clear knowledge; that he was foully murdered there is no doubt. The penalty of dethronement, pronounced by the Parliament, could not satisfy the man who succeeded him as Henry IV.

Gems from the Poets.



HENRY WADSWORTH LONGFELLOW.

1807—1882.

HENRY WADSWORTH LONGFELLOW, a distinguished American poet, was the son of the Hon. Stephen Longfellow, and was born at Portland, Maine, U.S.A., on the 27th February, 1807. He entered Bowdoin College at the age of fifteen, and graduated with honours in 1825. He was intended by his father for the law, but this was not to his taste, which inclined to the literary profession. He had contributed some poems to the *United States Literary Gazette*, and soon after graduating was made Professor of Modern Languages at his own College. He set out for a three years' tour in Europe, in order to qualify himself for the post, and spent his time most advantageously in studying the languages and literature of the countries through which he passed. On his return home in 1829 he

entered upon his duties at Bowdoin, and published a record of his travels—'Outre-Mer, a Pilgrimage beyond Seas.' Five years later he resigned his Professorship at Bowdoin, and after spending twelve months in Germany and Northern Europe, accepted a similar appointment at Harvard University. There he resided until 1854, by which time he had produced the works that made him famous. After giving up his post at Harvard, he resided at Cambridge, U.S.A., where he lived surrounded by many celebrated men and women. From thence he sent forth at times new poems, full of his own great power. Here he died on the 24th March of the present year. Longfellow's poems are characterized by a simplicity and sweetness of style that is possessed by few other writers, and certain of his shorter pieces will have an enduring popularity. His chief long poems are 'Evangeline,' 'Miles Standish,' 'Hiawatha,' and 'Tales of a Wayside Inn,' but the collections entitled 'Ballads and other Poems,' 'Poems on Slavery,' 'Birds of Passage,' and 'Flower de Luce,' contain his best work.

J. S. FLETCHER.

FLOWERS.

SPAKE full well, in language quaint and olden,
One who dwelleth by the castled Rhine,
When he called the flowers, so blue and golden,
Stars, that in earth's firmament do shine.

Stars they are, wherein we read our history,
As astrologers and seers of eld;
Yet not wrapped about with awful mystery,
Like the burning stars which they beheld.

Wondrous truths, and manifold as wondrous,
God hath written in those stars above;
But not less in the bright flowerets under us,
Stands the revelation of His love.

Bright and glorious is that revelation,
Written all over this great world of ours;
Making evident our own creation
In these stars of earth—these golden flowers.

And the poet, faithful and far-seeing,
Sees, alike in stars and flowers, a part
Of the self-same universal being,
Which is throbbing in his brain and heart.

Gorgeous flowerets in the sunlight shining,
Blossoms flaunting in the eye of day,
Tremulous leaves, with soft and silver lining,
Buds that open only to decay;

Brilliant hopes, all woven in gorgeous tissues,
Flaunting gaily in the golden light;
Large desires, with most uncertain issues,
Tender wishes, blossoming at night!

These in flowers and men are more than seeming,
Workings are they of the self-same powers,
Which the poet, in no idle dreaming,
Seeth in himself and in the flowers.

Everywhere about us are they glowing,
Some like stars, to tell us Spring is born;
Others, their blue eyes with tears o'erflowing,
Stand like Ruth, amid the golden corn;

Not alone in Spring's armorial bearings,
And in Summer's green-emblazoned field,
But in arms of brave old Autumn's wearing,
In the centre of his brazen shield;

Not alone in meadows and green alleys,
On the mountain-top, and by the brink
Of sequestered pools in woodland valleys,
Where the slaves of nature stoop to drink;

Not alone in her vast dome of glory,
Not on graves of bird and beast alone,
But in old cathedrals, high and hoary,
On the tombs of heroes, carved in stone.

In the cottage of the rudest peasant,
In ancestral homes, whose crumbling towers,
Speaking of the Past unto the Present,
Tell us of the ancient Games of Flowers;

In all places then, and in all seasons,
Flowers expand their light and soul-like wings,
Teaching us, by most persuasive reasons,
How akin they are to human things.

And with child-like, credulous affection,
We behold their tender buds expand;
Emblems of our own great resurrection,
Emblems of the bright and better land.

THE WRECK OF THE HESPERUS.

IT was the schooner Hesperus,
That sailed the wintry sea;
And the skipper had taken his little daughter,
To bear him company.

Blue were her eyes as the fairy flax,
Her cheeks like the dawn of day,
And her bosom white as the hawthorn buds
That ope in the month of May.

The skipper he stood beside the helm,
His pipe was in his mouth,
And he watched how the veering flaw did blow
The smoke now West, now South.

Then up and spake an old sailor,
Had sailed the Spanish main,
'I pray thee, put into yonder port,
For I fear a hurricane.

'Last night, the moon had a golden ring,
And to-night no moon we see!'
The skipper, he blew a whiff from his pipe,
And a scornful laugh laughed he.

Colder and colder blew the wind,
A gale from the North-east;
The snow fell hissing in the brine,
And the billows frothed like yeast.

Down came the storm, and smote amain
The vessel in its strength;
She shuddered and paused, like a frighted steed,
Then leaped her cable's length.

"Come hither! Come hither! my little daughter,
And do not tremble so;
For I can weather the roughest gale
That ever wind did blow.'

He wrapped her warm in his seaman's coat,
Against the stinging blast;
He cut a rope from a broken spar,
And bound her to the mast.

'O father! I hear the church-bells ring,
O say, who may it be?'
''Tis a fog-bell on a rock-bound coast:'
And he steered for the open sea.

'O father! I hear the sound of guns,
O say, what may it be?'
'Some ship in distress that cannot live
In such an angry sea!'

"O father! I see a gleaming light,
O say, what may it be?'
But the father answered never a word,
A frozen corpse was he.

Lashed to the helm, all stiff and stark,
With his face turned to the skies,
The lantern gleamed through the gleaming snow
On his fixed and glassy eyes.

Then the maiden clasped her hands and prayed
That saved she might be;
And she thought of Christ who stilled the wave
On the Lake of Galilee.

And fast through the midnight dark and drear,
Through the whistling sleet and snow,
Like a sheeted ghost, the vessel swept
Towards the reef of Norman's Woe.

And ever the fitful gusts between
A sound came from the land;
It was the sound of the trampling surf
On the rocks and the hard sea-sand.

The breakers were right beneath her bows,
She drifted a weary wreck,
And a whooping billow swept the crew
Like icicles from her deck.

She struck where the white and fleecy waves
Looked soft as carded wool;
But the cruel rocks, they gored her side
Like the horns of an angry bull.

Her rattling shrouds, all sheathed in ice,
With the masts went by the board
Like a vessel of glass, she stove and sank,
Ho! Ho! the breakers roared!

At daybreak, on the bleak sea-beach,
A fisherman stood aghast,
To see the form of a maiden fair
Lashed close to a drifting mast.

The salt sea was frozen on her breast,
The salt tears in her eyes;
And he saw her hair, like the brown sea-weed,
On the billows fall and rise.

Such was the wreck of the Hesperus,
In the midnight and the snow!
Christ save us all from a death like this,
On the reef of Norman's Woe!

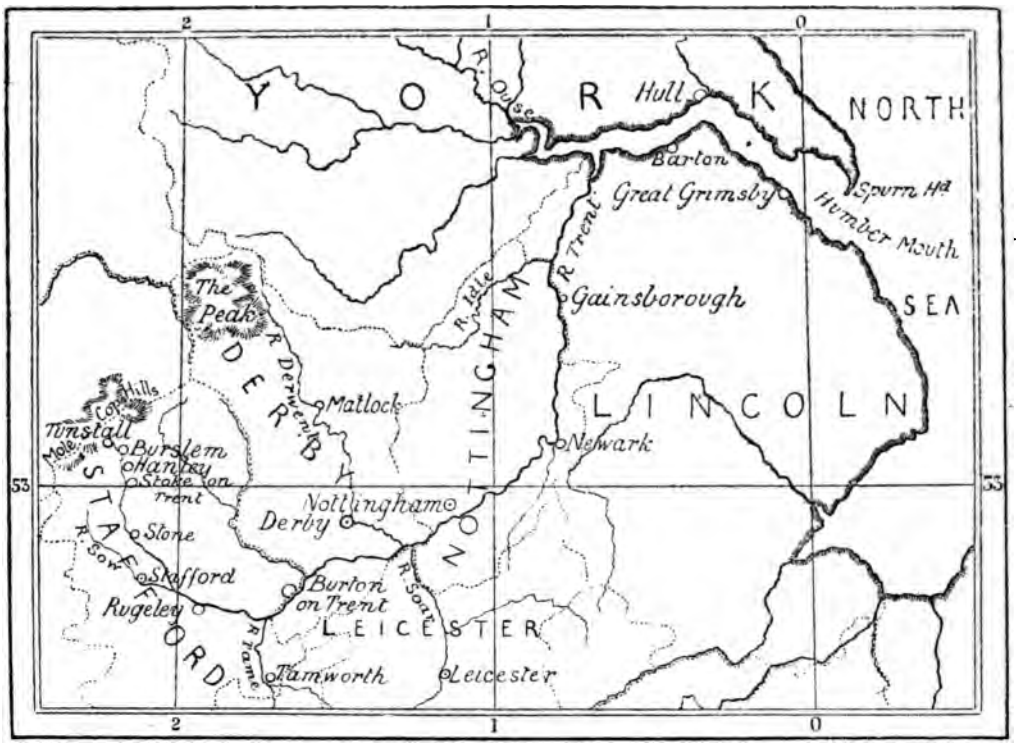
Dictionary.

EXPLANATORY LIST OF THE MORE DIFFICULT WORDS OCCURRING IN THIS NUMBER

Aghast, struck with horror.
Amain, with great force.
Armorial bearings, coats of arms, crests.
Astrologer, one who pretends to foretell events by the stars.
Barge, a small ship.
Carded wool, combed wool.
Courtesy, politeness.
Credulous, ready to believe.
Delve, to dig.
Eld, old.
Envoys, messengers.
Estuary, the wide mouth of a river up which the tide flows.
Eventually, at last.
Firmament, the sky.
Flaunting, waving in the wind.
Flaw, breeze, wind.
Graduated, passed through the university course and received a degree.
Green-emblazoned, decked out in green.
Hesperus, the Evening Star or Venus.
Hosiery, stockings and socks.
Hostage, one who remains with the enemy as a pledge for the fulfilment of a treaty.
Insurgents, rebels.
Literary, relating to letters or learning.
Manor-house, the house belonging to a *manor* or estat
Mineral, that which is dug out of a mine.
Notoriously, thoroughly, infamously.
Peasants, country people, rustics.
Penalty, a punishment.
Reef, a ridge of rocks.
Revoked, recalled.
Rivetting, fastening securely.
Scant, little, small.
Scoundrel, a mean fellow.
Seers, prophets.
Sequestered, lonely, secluded.
Serfs, slaves.
Shrouds, ropes, rigging.
Surety, security against loss.
Tiler, one whose trade is to cover houses with tiles.
Tour, a trip.
Tremulous, trembling.
Tributary, a river which flows into another.
U.S.A., United States of America.
Veering, changing its direction.
Went by the board, snapped off close to the deck.
Yeast, the froth of new ale, used in making bread.

WORDS, SOMEWHAT DIFFICULT IN SPELLING, NOT OCCURRING IN THE ABOVE LIS

Answered.
Carbonaceous.
Council.
Farinaceous.
Flannel.
Gorgeous.
Grievances.
Icicles.
Immediately.
Message.
Muscle.
Mysteries.
Oppressors.
Palace.
People.
Quaint.
Saccharine.
Salisbury.
Scrupulously.
Seized.
Simplicity.
Solemnly.
Vegetable.
Violence.



Up our Rivers.

III.—THE TRENT.

LAST month we traced the course of the Severn. This month we take the Trent, a river 180 miles long, draining the north midland counties of England, and falling eventually into the North Sea by means of a large wide mouth called the Humber. We will commence our journey at the junction of this estuary with the sea, though, strictly speaking, the real mouth of the Trent lies many miles up stream.

To begin with, our course lies in a north-easterly direction, having Spurn Head and Yorkshire on our right, and the coast of Lincolnshire to the left.

Great Grimsby, an old-fashioned sea-port in the latter county, is the first town we pass, and fifteen miles more bring us off Hull, or, as its name runs in full, Kingston-on-Hull.

This famous old port derives its name Kingston from King Edward I., who gave it a charter and extensive privileges. It showed itself, however, anything but a *king's town* in 1642, at the commencement of the Great Civil Wars, when Sir John Hotham, its governor, refused to open the gates to Charles I.

In the present day it ranks very high among the ports of England, its trade being chiefly with the Baltic.

Our course then lies almost due west, and after passing Barton, a small town on the Lincoln side, we reach Trent Falls, the true mouth of the Trent. Here we turn sharp southward, and before we reach the point at which the river Idle joins the main stream from the right, we see some of the prettiest river scenery in that part of England.

Gainsborough, the next town we arrive at, though twenty-five miles from the Humber, possesses a very considerable sea-trade. Steamers and sailing-vessels constantly ply between it and Hull.

After travelling another twenty-five miles, for about half of which the river forms the boundary between the counties of Nottingham and Lincoln, we reach Newark.

This is a very old town, and its name is supposed to be a corruption from New Work, the name given to a castle erected here in Stephen's days. It was to the Scotch army encamped at Newark, in 1646, that Charles I. surrendered himself after his flight from Oxford.

Our course now is, generally speaking, to the south-west. We pass near Nottingham, a town celebrated for its manufacture of hosiery and lace, and a few miles further on we see the mouth of the Soar on our left, and that of the Derwent on the right. The latter river, the largest tributary of the Trent, rises in the north of Derbyshire, in the mountainous district near the Peak, and flows southward past Matlock and Derby, until it joins the main stream.

We then proceed nearly due west across the south of Derbyshire, pass the mouth of the tributary Dove, which separates that county from Staffordshire, and reach Burton-on-Trent.

This town is celebrated for its enormous trade in beer and all things connected with it. There are about thirty breweries in the town, each of the two largest of which, belonging to Messrs. Bass and Allsopp respectively, covers about fifty acres of ground.

A few miles more bring us to the small iron-making town of Rugeley, before coming to which, however, we pass the mouth of the Tame, the river which gives Tamworth its name. After passing Rugeley our course grows gradually more northerly. We see the mouth of the Sow (on which Stafford is situated) on our left, leave behind us the small town of Stone, and reach Stoke-on-Trent, a place with a large population chiefly engaged in the making of pottery.

The next three towns, Hanley, Burslem, and Tunstall, are all engaged in the same industry, and the whole district goes under the name of the Potteries.

The source of the Trent is in the Mole Cop Hills, about four miles north-west of Burslem.

SUMMARY.

Source	In the Mole Cop Hills, extreme north of Staffordshire.
Course	In a curve, first south, then east, then north.
Length	180 miles.
Counties through which it flows	Staffordshire, Derbyshire, Nottingham, Lincoln, and between the latter county and Yorkshire.
Tributaries on right bank	Sow, Tame, and Soar.
Tributaries on left bank	Dove, Derwent, and Idle
Towns on its banks	Tunstall, Burslem, Hanley, Stoke-on-Trent, Stone, Rugeley, Burton-on-Trent, Nottingham, Newark, Gainsborough, Barton, Hull, and Grimsby. (The last three are, strictly speaking, on the Humber.)

Algebra.

BY W. H. HARVEY, B.A. (LONDON).

LIKE TERMS.—When terms do not differ at all (as $4a$ and $4a$), or when they differ only in their *numerical coefficients* (as $4a^2bc$ and $10a^2bc$), they are said to be *like* or *similar*. Otherwise (*i.e.*, when they differ in their letters) they are called *Unlike*. Thus a, b, $2a^2b$ $4abc$ are all *Unlike Terms*.

ADDITION.

I. The addition of LIKE TERMS preceded by the same sign (*i.e.*, either all positive or all negative).

RULE.—Add together the numerical coeffi-

cients, affix the common letter or letters, and prefix the common sign.

Thus

$$3a+4a+6a=13a$$
$$-3a-4a-6a=-13a$$

EXERCISE IV.

(1) Add together $5b$, $6b$, $7b$, and $14b$.
(2) Add together $-6bc$, $-8bc$, $-20bc$, and $-14bc$.
(3) Add together $131xyz$, $142xyz$, and $729xyz$.
(4) Find the sum of $3abc$, $15abc$, $17abc$, and $33abc$.

(5)
$$\begin{array}{r} -14xyz \\ -32xyz \\ -\ xyz \\ -65xyz \\ \hline \end{array}$$

(6)
$$\begin{array}{r} 303mp \\ 47mp \\ 389mp \\ 627mp \\ \hline \end{array}$$

(7) Add together the *like terms* in
$3a+2bc-5c+2a+6bc-7c+8a+5bc-9c$.

(8)
$$\begin{array}{r} a+\ b-\ c \\ 3a+\ 7b-3c \\ 6a+16b-7c \\ a+\ b-\ c \\ \hline \end{array}$$

(9)
$$\begin{array}{r} 3x-\ 7y+2z \\ 5x-\ y+\ z \\ 17x-\ 5y+6z \\ 2x-10y+3z \\ \hline \end{array}$$

If the numerical coefficients are fractions, we use the ordinary arithmetical rules for adding them together, and then affix the common letters and prefix the common sign as before.

Thus

$$\tfrac{1}{2}a+\tfrac{1}{4}a+\tfrac{3}{4}a=\tfrac{4}{4}a$$
$$-\tfrac{1}{2}a-\tfrac{3}{4}a=-\tfrac{6}{4}a-\tfrac{3}{4}a$$
$$=-\tfrac{9}{4}a.$$

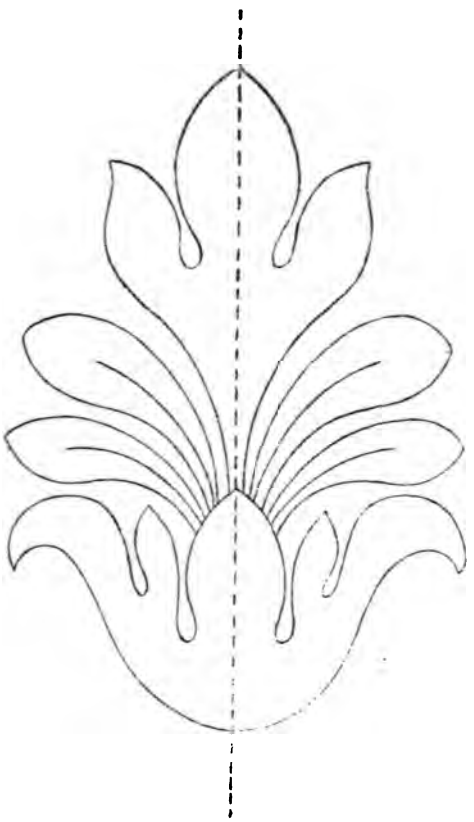
NOTE.—In the case of fractional coefficients the letters are usually written after the numerator above the line, thus

Instead of $\frac{1}{2}a$ we write $\frac{a}{2}$
,, $\frac{3}{4}ab$,, $\frac{3ab}{4}$
,, $5\frac{1}{4}xyz$,, $\frac{21xyz}{4}$

This must be borne in mind in working the following exercises.

(The Answers to the Arithmetic and Algebra appear in the May number of the *Practical Teacher* and the *Governess*).

Freehand Drawing Copies.



Arithmetic. STANDARD III.

A. 1. Divide 271,683 by 16.
2. „ 846,017 by 38.
3. „ 4,708,246 by 680.

B. 1. Divide ninety thousand and fifty by eighty-three.
2. (7,601,831 − 800,917) ÷ 409.
3. (12,706,425 ÷ 15) ÷ 2095.

C. 1. Multiply together the sum, difference, and product of 96 and 32.
2. Take £93 7s. 5¾d. from £4,000.
3. Add together £701 16s. 8½d., five thousand and twenty pounds and ninepence, 18s. 4¾d., five hundred and eighteen pounds seventeen shillings and sevenpence, £17 18s. 10¾d., and sixty thousand pounds.

D. 1. Take 569 florins from £87.
2. Divide 9,201,680 by 70,619.
3. A farmer went to market with £5 12s. 6d. in his pocket. He sold a horse for £22 17s. 6d., and bought a cow for £16 10s.;—how much did he take home, his expenses being 4s. 10½d.?

E. 1. Bring 901,715 farthings to £ s. d.
2. How many threepences are there in 9173½ guineas?
3. Add together 715 half-crowns, 945 sixpences, 717 fourpences, and 3¼ guineas.

F. 1. Divide thirty-seven million fourteen thousand and twenty by 89,705.
2. From seventeen million threepences take nineteen million twopences.
3. A dealer bought a million marbles for £62 12s. 6d., and he sold them at 2½d. a 100;—how much did he gain or lose?

ADVANCED EXAMINATION.

1. A fishmonger bought 5 barrels of herrings, each containing 1,200, for £10 17s. 6d. He sold 1,000 of the finest at 1d. each, 3,500 at ½d. each, and the remainder at 5 for a penny;—how much did he gain or lose?

2. Take eighty-one thousand and sixteen pounds and fourpence farthing from seven million twelve thousand and ten pounds and twopence.

3. A baker's bill is £1 17s. 6½d., a butcher's bill is 16s. 10½d. more than the baker's, a grocer's is 12s. 6d. less than the sum of the two just mentioned, and a draper's is as much as all the other three added together. Find the total amount of the four bills.

STANDARD IV.

A. 1. £683 17s. 9¾d. × 16.
2. £789 15s. 11½d. × 63.
3. £76,801 14s. 9½d. ÷ 15.

B. 1. Multiply £3 0s. 7¾d. by 957.
2. Divide £23,746 18s. 2½d. by 385.
3. How many coats, each requiring 2 yds. 1 qr. 1 nl. of cloth, could be made out of 184½ yards?

C. 1. Bring 9,016,015 seconds to days, etc.
2. £6,178,345 18s. 10d. ÷ 93,605.
3. If needles are 2½d. a score, how many gross could be bought for £2 3s. 6d.?

D. 1. Bring 8,019,125 oz. to tons, etc.
2. How many square feet are there in 14 ac. 3 rd. 15 per. 14 sq. yds.?
3. £67 14s. 9¾d. × 8061.

E. 1. Bring 4½ cubic yards to cubic inches.
2. A grocer mixed 16 lbs. of tea at 3s. 9d. a lb. with 32 lb. at 3s. 3d. a lb.; what are 2½ lbs. of the mixture worth?
3. £61,714 19s 2½d ÷ 90,684.

F. 1. If bacon be 6¾d. a lb., how many tons, cwts., etc., could be bought for £189 6s. 9d.?
2. 63 days 17 hr. 41 m. 53 secs. × 243.
3. If 190 beans would fill a pint measure, how many would there be in 12 qr. 3 b. 3 pk.?

ADVANCED EXAMINATION.

1. A person bought a number of oranges at 4½d. a dozen, and sold them at 5 for 2d., thus gaining 5s. 9d. on the lot; how many did he buy?
2. A cattle dealer bought 80 bullocks for £1,277 10s.; he sold 20 of them at £22 15s. each, and 50 at £17 2s. 6d. each; at what price each must he sell the remainder so as to gain £157 10s. on his outlay?
3. From a piece of cloth 100 yards long were cut 24 coats, each requiring 2 yd. 3 qr. 1 nl., and 18 vests, each requiring 2 qr. 2 nl. The remainder was made into boys' caps, each requiring 2 nl. ½ inch;—how many caps were made?

STANDARD V.

A. 1. 9,085 articles at ⅜d. each.
2. 61,539 „ 2½d. „
3. 83,697 „ 8¼d. „

B. 1. 8579 coats at 7s. 9½d. each.
2. 9153 „ 18s. 5½d. „
3. 8473 „ 17s. 0½d. „

C. 1. 4179 horses at £9 17s. 5d.
2. 7183 „ £35 11s. 11d.
3. What would one million three hundred and ninety-eight thousand nine hundred and sixty articles cost, at 5¾ guineas a *gross*?

D. 1. 80 tons 16 cwt. 3 qr. 14 lb. at £4 17s. 8d. a ton.
2. 16 days, 17 hours, 36 min., at 6s. 8d. a *min.*
3. 156 lb. 11 oz. 18 dwt. at £3 16s. 4d. a lb.

E. 1. 9176¾ at £56 13s. 9d. each.
2. What would 18¾ million needles cost at 3s. 7½d. a thousand?
3. 38 tons 16 cwt. 3 qr. 10½ lb. at 4s. 7½d. per *stone* of 14 lb.

F. 1. What number bears the same ratio to 162 as 5 bears to 9?
2. If 14 books cost £3 17s. 6d., what would 161 cost?
3. Make out the following bill in proper form: 13,700 common bricks at 27s. 6d. a 1000, 7,750 red stock bricks at 36s. 9d. a 1000, 3,800 white stock bricks at 37s. 6d. a 1000, 7200 slates at 16s. 9d. a gross, and 775 paving blocks at 12s. 9d. a 100.

STANDARD V.—*Continued.*

ADVANCED EXAMINATION.

1. Make out the following bill, and then deduct a penny in the shilling from the amount: 14 lb. of tea at 1$\frac{3}{4}$d. an oz., 21 lb. of soap at 27s. 4d. a cwt., 1$\frac{1}{2}$ cwt. of bacon at 6$\frac{1}{4}$d. a lb., 3$\frac{1}{2}$ oz. of cloves at 6s. a lb., 2$\frac{1}{4}$ cwt. of rice at 15 guineas a ton, and 4 lemons at 7$\frac{1}{2}$d. a dozen.
2. What would 150 cheeses, each weighing 1 qr. 3$\frac{1}{2}$ lb. be worth, if 5$\frac{1}{2}$ lb. cost 3s. 10$\frac{3}{4}$d.?

A. 1. $\frac{2}{3} + \frac{3}{4} + \frac{7}{8} + \frac{19}{20}$.
2. $(6\frac{3}{4} + 10\frac{1}{2}) - (8\frac{3}{4} + 3\frac{1}{8})$.
3. Bring 5s. 7$\frac{1}{2}$d. to frac. of 6$\frac{1}{2}$ guineas.

B. 1. Take ·00625 from ·625.
2. Divide 71·35 by ·035675.
3. How much is ·035 of £5 18s. 9d.

C. 1. If 18 men mow 200 acres of corn in 14 days, how many acres could 4 men mow in 10 days?
2. A can mow an acre in 8 hours, B in 6, and C in 5 hours; in what time could they together mow 1$\frac{1}{2}$ acres?
3. If 5 men or 9 boys can do a piece of work in 8 hours, in what time could 3 men *and* 5 boys do it?

D. 1. $(21\frac{1}{2} \cdot 18\frac{1}{2} + 4\frac{1}{2}\frac{1}{8}) \div (17\frac{1}{8} + 4\frac{1}{2}\frac{1}{8})$.
2. Simplify $\frac{2\frac{1}{2}}{5\frac{1}{2}\frac{1}{8} \times 8\frac{1}{2}}$.
3. What would 16·015 tons of cheese cost, if 4$\frac{1}{2}$ lb. cost 3$\frac{1}{2}$$\frac{1}{6}$s.?

STANDARD VI.

E. 1. Find the cost of glazing 20 windows, each containing 16 panes, each pane being 1$\frac{1}{2}$ feet by $\frac{1}{2}\frac{1}{2}$ foot, at 3s. 10$\frac{1}{2}$d. a square *yard*.
2. How many ounces are there in $\frac{3}{4}$ of $\frac{1}{2}$ of $\frac{1}{10}$ of $\frac{1}{2}\frac{1}{2}$ of $\frac{1}{2}\frac{1}{2}$ of $\frac{1}{10}$ of 2·08 tons?
3. If 20 men in 30 days of 10 hours dig a trench 400 yards long and 5 feet deep, what length of trench 8 feet deep could 15 men dig in 50 days of 9 hours each?

F. 1. Bring ·075 of ·015 of ·35 of £20 to the decimal of half-a-crown.
2. Simplify $\frac{3\cdot009 + 1\cdot091 - 3\cdot957044}{12\cdot96}$
3. A can walk 8$\frac{1}{2}$ miles in 2$\frac{1}{2}$ hours, and B 7$\frac{1}{2}$ miles in 2 hours;—find the simplest ratio of their velocity.

STANDARD VII.

D. 1. What sum must be invested at 4 per cent. simple interest for 2$\frac{1}{2}$ years, so that when withdrawn the amount may be £2,500?
2. The premium paid for insuring a building at 4s. 3d. per cent. is £9 4s. 10$\frac{1}{2}$d.;—how much is it insured for?
3. Find the *compound* interest on £880 for 4 years at 4 per cent.

E. 1. Divide £100 among 4 persons in the ratio of $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, and $\frac{1}{5}$. Find the greatest share.
2. If £350 be deposited on March 3rd and withdrawn on Oct. 17th, find the interest at 3 per cent.
3. Find compound interest of £640 for 3 years at 5 per cent.

F. 1. Find the square root of 4000·5625.
2. Find the cube root of 32·768375.
3. If marbles are bought at 2s. 3d. a thousand, and sold at a penny a score, what is the gain per cent.?

3. Divide £23 17s. 6d. among 18 men, 32 women, and 48 boys, so that for every shilling that a boy gets a woman may receive 2s. 6d. and a man 3s. 6d.;—what will each receive?

ADVANCED EXAMINATION.

1. If 40 men eat 80 five-lb. loaves in 6 days, and 90 women eat 240 four-lb. loaves in 8 days, find the ratio of appetite between a man and a woman.

2. Add together the sum, difference, product, and two quotients of 2$\frac{1}{2}$ and 5$\frac{1}{4}$.

3. A grocer bought 10·375 tons of currants for 295·45 guineas. He sold half of them at ·085 crown a lb., 2·06 tons at ·0275 of 15s. 9d. a lb., and the remainder at £·0185 a lb.; find his gain or loss on the transaction.

ADVANCED EXAMINATION.

1. A can mow an acre of grass in 10 hours, B in 8, and C in 12. They have together to mow 1$\frac{1}{2}$ acres;—at what o'clock will the work be completed, A commencing at 6 a.m., B at 7 a.m., and C at 7.30 a.m.?

2. A gentleman dies, and leaves his daughter, who is just 16 years of age, £6,000;—what will she be worth at 21 years of age, the money being invested at 5 per cent. compound interest, but £175 being withdrawn at the *end* of each year for her support and education?

3. Two adjoining landowners exchange pieces of land, the one giving to the other a rectangular field 300 yards by 200, which is valued at £60 an acre, he receiving in lieu of it a square field valued at £65 an acre. Find the side in yards of this square field.

The Pith of a Course of Domestic Economy Lessons.

BY MRS. WIGLEY,
Author of 'The Marshfield Maidens,' etc.

LESSON IX.

LET us remind ourselves of all we have learned.

"*Over again* and *over again*
Will fix the truth in our minds, 'tis plain."

Domestic economy is the science of women and girls, because it teaches the right management of the home and its inmates. All that concerns our health, our happiness, or our prosperity, should be attended to by our domestic economy.

Health is the greatest of all earthly blessings. We cannot feel happiness, or care for prosperity, if we are suffering, or ailing, or weak. In great measure the healthiness of our bodies is placed in our own keeping and care. There are certain fixed laws which promote health if they are carefully observed; but if they are disregarded and broken, sickness must follow. One of these laws requires that the body shall be properly fed, another refers to the way it should be kept warm, and a third to the way it should be cleansed.

Some people are quite careless about these things; they do not even trouble to find out what is necessary, and they bring about all sorts of mischief by the mistakes they make. More little children die from neglect of these laws than from all other causes put together. They do not get proper food, or warmth, or cleanliness.

LESSON X.

WE said that the work of food in our bodies was three-fold.

I. *It has to keep up a regular internal heat*—always to be the same. Not very hot one hour and rather chilly the next.

The food that does this is called carbonaceous. Carbonaceous foods are of three kinds:—

1. The Farinaceous—or starchy foods.
2. The Oleaginous—or oily, fatty foods.
3. The Saccharine—or sugary foods.

II. *It has to mend up constantly the parts that have been worn away by constant use.*

Food that repairs the daily waste we call Nitrogenous food. Here is the list of the principal of these:—Fibrine, Gluten, Albumen, Casein, Legumin, Gelatine.

III. It has to supply materials for bones, hair, nails, etc. And it does this by what are called our mineral foods. These foods are introduced into the body in various ways in the water we drink, the vegetables we eat, and by salt.

The principal mineral foods which our bodies require, and which are supplied in these ways, are **lime, iron, potash or soda, and salt.**

LESSON XI.

IF any one were to ask you to mend a shoe, you would look for some leather. If you had a deal box to mend, you would want a piece of deal. You know you must repair glass with glass, silk with silk, metal with metal, and flannel with flannel.

There are a great many things in the world which often want mending as well as these bodies of ours. There is no doubt it would make matters more simple if we could always go to the same kind of material for our pieces. But we know this would not do. A piece of wood would not repair a saucepan, nor a bar of iron a silk dress. We choose things for certain purposes because they are most fitted for those purposes; and if they need mending, we get some stuff of the same kind, of the same quality, of the same colour, and of the same pattern, before we can mend them properly. There is no doubt that the repairs which are needed day after day in our bodies require us to take some trouble. We said the foods we eat mend all our wasted or worn-out parts; and we said the same kind of food would not do to mend every part. The food that makes flesh will not make bones; that which makes us warm will not supply hair or nails. We must eat as many kinds of food as there are parts to be repaired.

LESSON XII.

NOW you can tell that feeding people with the right kind of food is a very serious business indeed. Many little babies do not learn to walk a long while after they should do so, because they are not allowed to eat any bone-making food. And many other children break out in sores and blotches all over the face because they are not supplied with any of the mineral foods which make the blood pure. And it is the same with grown-up people. They do not attend to this, and they find themselves getting weak or ailing, or thin and generally unhealthy. A woman who has learned domestic economy knows how to prevent all this mischief.

Our Will was a laddie, just learning a trade,
And proud of his skill with the tool;
And Milly, his sister, was mother's best maid,
When she was not busy at school.

But Will thought that women and girls were 'poor things,'
'Only good to make puddings and tea;'
'Aint I glad I'm a boy, feel my muscle and bone,
That's the stuff to get on with, you'll see.'

But father knew well 'twas the home-care and skill
Which built up their bodies in health;
'And you'd be a lost laddie without them, my Will,
Home love is more precious than wealth.'

THE COUNCIL OF THE MICE.

Allegretto spiritoso. *mf* — *Music by* T. CRAMPTON.

1st TREBLE. 2nd TREBLE. BASS.

1. One sum - mer eve, when all was still, When not a soul was wak - ing, When

KEY A. *Allegretto spiritoso. mf*

1st TREBLE. 2nd TREBLE. BASS.

fai - ries danced by ev - 'ry rill, And elves a stroll were tak - ing— With - in a farm - er's

E. t. f. A.

emp - ty barn, In plea - sant sum - mer wea - ther, The mice, se - cure from chance of harm, In

Symph.

coun - cil met to - ge - ther.

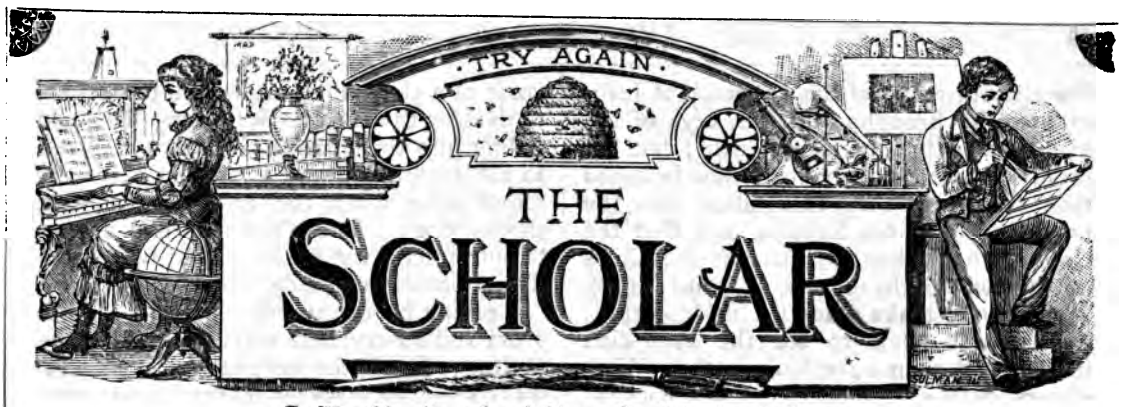
Symph.

2. In solemn rows they sat around,
Their mournful fate lamented,
How cats their dearest haunts had found,
And all their lives tormented.
"Is there no way," they cried in grief,
"This dreadful foe to vanquish?
No way for us to find relief
From days and nights of anguish?"

3. At last a mouse of aspect grave—
While thoughts of woe distressed them—
A joyous squeak of triumph gave,
And in these words addressed them:
"Around his neck we'll hang a bell,
And, in a moment's twinkling,
Of his approach 'twill surely tell,
And warn us by its tinkling."

4. They hailed with joy the words which fell,
In songs of triumph sang it;
But when the mouse produced the bell,
No one was found to hang it!
So, still the cat, with footstep light,
The mice is still tormenting;
And still in many a quiet night
We hear the mice lamenting.

LONDON: PUBLISHED BY JOSEPH HUGHES, PILGRIM STREET, LUDGATE HILL.



A Monthly Educational Paper for School and Home.
Conducted by JOSEPH HUGHES.

No. 4. Vol. I. JUNE, 1882. [Price ½d. Per post, 13 copies for 7½d.

CONTENTS.

1. Stories from English History 37
2. Gems from the Poets 39
3. Algebra 41
4. Freehand Drawing Copies 42
5. Up our Rivers.—IV. The Yorkshire Ouse. With Map .. 43
6. Arithmetic for Standards III., IV., V., VI., VII. .. 44
7. Domestic Economy 45
8. Dictionary 47
9. Music 48

Stories from English History. 4.—The Exploits of Richard the Lion-Hearted.

BY THE REV. SIR G. W. COX, BART., M.A.

KING HENRY II. had no great liking for pilgrimages and crusades; and although after the death of Thomas of Canterbury he promised to lead an army with the French King to the Holy Land, he was not very eager to fulfil his promise.

[ALL RIGHTS RESERVED.]

For the entreaties of the Patriarch of Jerusalem, who brought him the keys of the Holy Sepulchre, he cared little; but his mind was somewhat changed when he heard that the Holy City had fallen into the hands of the infidel Saladin, and that the Crescent had taken the place of the Cross on the dome of the mosque of Omar (1187). He began to make ready for his departure; but he was never to see the snow-clad heights of Lebanon, or look on the rushing waters of the Jordan. His son Richard made a covenant with the French king, and was joined by many of his father's barons. Henry asked to see the list of those who had done this. At the head was the name of his son John, whom he wished to make heir to the English crown. He could read no further. He fell into a raging fever, and in a week he died (1189).

Richard the Lion-hearted now became King of England; but his mind was set, not on the good of his people, but on adding to his own glory, and his glory could be increased in no other way so effectually as by girding on his sword to do battle with the infidels in Palestine. What he needed most was money, and he was better able to get it than was Duke Robert of Normandy, the brother of the Red King. Richard sold earldoms and bishoprics, and the claims which he had on the homage of the king of Scotland. He looked for much from the Jews, and the Jews, in their eagerness to win his favour by their gifts, entered his palace on his coronation day, although he had ordered that they should not do so. The mob thrust them out, and murdered them; and so the signal was given for the persecution and slaying of Jews in all parts of the country. At York they hurried with their goods into the castle. The governor left it; and, taking this as a sign that he was plotting with the Christians for their destruction, they closed the gates against him on his return. With the armed bands of the sheriff, and with the mob of the city, the governor advanced to the attack, and the Jews could hear the voice of a clergyman urging on the people to destroy the enemies of Christ. To avoid falling into their hands, the Jews resolved to kill each other, and a very few only were found alive when the castle gates were thrown open. These few men had agreed to surrender if their lives should be spared. The promise was made, and it was broken.

Leaving his country in this state of disorder and misery, Richard reached Palestine in time to join in the siege of Acre. Saladin was compelled to surrender the town (1191); and he agreed to give up the piece of the true cross which had been taken from the Christians in the battle of Tiberias, and to give some thousands of hostages for the payment of a large sum of money within forty days. The days passed and the money was not paid, nor was the piece of the true cross given up. On the forty-first day two thousand seven hundred of the hostages were led up to the top of a hill, from which the sight could be seen in the camp of Saladin, and were there all slaughtered; and a number not much smaller were put to death at the same time on the walls of the city.

Richard still longed to recover Jerusalem; but when he reached Bethlehem, the Crusaders found that they could not dare to advance farther. The Turks had destroyed the wells, and they would die for want of water. He was led to the top of a hill from which he might see Jerusalem; but he held up his shield before his face, as being unworthy to look on the city which he had failed to rescue from the hands of Saladin. In all the battles which he had fought, he had shown indeed the strength and more than the courage of the lion; but it was of no use. He went on board his ship at Acre, and as he sailed from the shore he held out his arms and cried, 'Most Holy Land, I commend thee to the care of the Almighty; may He grant me life to return and deliver thee from the yoke of the infidels.' A great storm drove him from his proper course, and after battling with furious winds, he found himself on the

northern part of the coast of the Adriatic Sea. Richard knew that he had enemies in this land; but he hoped to escape by putting on a pilgrim's dress and letting his beard grow. He sent one of his companions, with the gift of a ruby ring, to ask for a passport for some pilgrims returning from the Holy Land. The governor of the city to whom he brought the ring looked at it long, and said, 'This jewel can come only from a king; that king must be Richard of England. Tell him he may come to me in peace.' But Richard was afraid to trust him, and in the night he fled away. For some days still he contrived to avoid notice, although his companions were one after another taken prisoners. At last only one young lad was left with him, and this boy, being taken in the market-place at Erperg, near Vienna, was put to the torture, and told his master's name. In a little while the Lion-hearted king was a prisoner in a Tyrolese castle (1192).

It was some time before his place of imprisonment became known, and some said that it was discovered by his faithful minstrel Blondel, who played a tune of which Richard was fond, and to which he answered from his dungeon. The English, who had been taxed to furnish money for his crusade, were now taxed still more heavily to furnish money for his ransom. The more they offered, there was one who for a time was able to outbid them; and this was John, Richard's younger brother. John wished to have the crown of England for himself, and he told the emperor that he would give him £20,000 for every month during which Richard's imprisonment might be prolonged. But the emperor had his barons to deal with, and his barons showed that they looked on his treatment of Richard as unjust and cruel, perhaps also as unwise. At last Richard was set free (1194), and he came back to England, which he had made poor, to make it poorer still by taxes raised to help him in new quarrels, from which he gained no more good than he had gained from his crusade.

Gems from the Poets.

WILLIAM WORDSWORTH. 1770—1850.

Taylor Coleridge.

WILLIAM WORDSWORTH, the son of a law-agent, was born at Cockermouth, in Cumberland, on the 7th of April, 1770. His early life was passed within easy reach of the district whose fame is so closely allied to his own, and his intimacy with its characteristic features ripened on his removal to Hawkshead Grammar School, at the age of eight years. He left Hawkshead for Cambridge in 1787, but he was never at ease during his university life, and withdrew to the lakes and mountains whenever it was possible to do so. In 1790 he set out for a tour on the Continent, and while absent from this country had ample opportunities of observing the revolutionary spirit in Europe. He graduated in 1793, and soon after this went to London, where he led a desultory life for some little time. The next year he made the acquaintance of Samuel whom he met at Nether Stowey, near which place he had taken up

his residence. This friendship was destined to be life-long, not only in social but in literary respects. The two men published in 1798 the famous 'Lyrical Ballads,' a volume of poems written against the taste of the age, and in defiance of the then recognised canons of criticism. From that time until 1825 Wordsworth published much, but whatever he sent forth was received with little favour by the critics, who saw only baldness in his simplicity, and inelegance in his homely style. Many people, however, recognised his claim to be regarded as a great poet, and about 1830 this claim began to be universally allowed. About 1800 he took up his permanent residence near Grasmere, and two years later was married to his cousin, Miss Hutchinson, of Penrith. Very little occurred during the remainder of his long life that requires mentioning. He continued to send forth new poems from time to time, caring little for adverse criticism. In 1834 he published a collected edition of his works, and in 1843 was made Poet-Laureate, this act being sufficient testimony to his worth. He died in 1850, and was buried close to the place where he had spent most of his life. Wordsworth is now regarded as a poet of the first rank, and we may safely predict that in another hundred years he will be held in still greater estimation. His chief power lies in his shorter poems, such as 'We are Seven,' 'The Highland Reaper,' 'The Two April Mornings,' and in such parts of longer poems as 'Margaret.' His long poems are weighted with philosophy, but when the gems that lie therein have been extracted, Wordsworth can present us with a body of work that is perhaps equalled in our language only by the poetry of Milton and of Shakspere.

J. S. FLETCHER.

TO THE CUCKOO.

O BLITHE New-comer! I have heard,
I hear thee, and rejoice.
O Cuckoo! shall I call thee Bird,
Or but a wandering Voice?

While I am lying on the grass
Thy twofold shout I hear;
From hill to hill it seems to pass,
At once far off and near.

Though babbling only to the vale,
Of sunshine and of flowers,
Thou bringest unto me a tale
Of visionary hours.

Thrice welcome, darling of the Spring!
Even yet thou art to me
No Bird, but an invisible Thing,
A voice, a mystery.

The same whom in my school-boy days
I listened to; that Cry
Which made me look a thousand ways
In bush, and tree, and sky.

To seek thee did I often rove
Through woods and on the green;
And thou wert still a hope, a love;
Still longed for, never seen.

And I can listen to thee yet;
Can lie upon the plain
And listen, till I do beget
That golden time again.

O blessed Bird! the earth we face
Again appears to be
An unsubstantial, fairy place,
That is fit home for Thee!

ALICE FELL; OR, POVERTY.

THE post-boy drove with fierce career,
For threatening clouds the moon had drowned;
When, as we hurried on, my ear
Was smitten with a startling sound.

As if the wind blew many ways,
I heard the sound,—and more and more;
It seemed to follow with the chaise,
And still I heard it as before.

At length I to the boy cried out;
He stopped his horses at the word,
But neither cry, nor voice, nor shout,
Nor ought else like it could be heard.

The boy then smacked his whip, and fast
The horses scampered through the rain;
But, hearing soon upon the blast
The cry, I bade him halt again.

Forthwith alighting on the ground,
'Whence comes,' said I, 'this piteous moan?'
And there a little girl I found,
Sitting behind the chaise, alone.

'My cloak!' no other word she spake,
But loud and bitterly she wept,
As if her innocent heart would break;
And down from off her seat she leapt.

'What ails you, child?'—She sobbed, 'Look here!'
I saw it in the wheel entangled,
A weather-beaten rag as e'er
From any garden scarecrow dangled.

There, twisted between nave and spoke,
It hung, nor could at once be freed;
But our joint pains unloosed the cloak,
A miserable rag indeed!

'And whither are you going, child,
To-night along these lonesome ways?'
'To Durham,' answered she, half wild.
'Then come with me into the chaise.'

Insensible to all relief
Sat the poor girl, and forth did send
Sob after sob, as if her grief
Could never, never have an end.

'My child, in Durham do you dwell?'
She checked herself in her distress,
And said, 'My name is Alice Fell;
I'm fatherless and motherless.

'And I to Durham, sir, belong.'
Again as if the thought would choke
Her very heart, her grief grew strong;
And all was for her tattered cloak!

The chaise drove on; our journey's end
Was nigh; and sitting by my side,
As if she had lost her only friend
She wept, nor would be pacified.

Up to the tavern door we post;
Of Alice and her grief I told;
And I gave money to the host,
To buy a new cloak for the old.

'And let it be of duffil grey,
As warm a cloak as man can sell!'
Proud creature was she the next day,
The little orphan, Alice Fell!

Algebra.

BY W. H. HARVEY, B.A. (LONDON).

No difficulty will be found in working the following Exercise if the learner remembers that

$\frac{b}{2}$ simply means 'half of b'

$\frac{3b}{4}$,, ,, 'three quarters of b'

$\frac{b}{4}$,, ,, 'one quarter of b'

and so on.

EXERCISE V.

(1) Add together $\frac{b}{2}+\frac{3b}{4}+\frac{b}{4}$

(2) Add together $\frac{7ab}{2}+\frac{11ab}{4}+\frac{5ab}{2}$

(3) Find the sum of $-\frac{x}{2}-\frac{x}{4}-\frac{3x}{4}$

(4) Find the sum of $-\frac{8xy}{2}-\frac{3xy}{4}-\frac{5xy}{4}$

(5) Find the sum of $\frac{6ab}{7}+\frac{9ab}{14}+\frac{10ab}{21}$

II. The addition of Like Terms, some Positive and others Negative (*i.e.*, some preceded by + and others by −).

RULE.—Add together first the numerical coefficients of the Positive Terms, and then those of the Negative Terms. Subtract one from the other, affix the common letters, and write + or − in front, according as the sum of the Positive Terms or that of the Negative Terms is the greater.

As beginners often find some difficu'ty in this case, we will work through an example, following the exact words of the above rule.

Suppose the question be to find the sum of

$$3a-14a+6a-7a+5a.$$

Add together the Numerical Coefficients of the Positive Terms (3+6+5=14), and then those of the Negative Terms (14+7=21). Subtract one result from the other (21−14=7), affix the common letter or letters (thus $7a$), and write + or − in front, according as the sum of the Positive or that of the Negative Coefficients is the greater. (In this case the sum of the Negative Coefficients is 21, that of the Positive only 14: therefore we write − in front of our result, and obtain for an answer, $-7a$.)

Expressed briefly the method of working is—

$$3a-14a+6a-7a+5a=14a-21a$$
$$=-7a.$$

EXERCISE VI.

Add together—

(1) $24b-36b+17b-15b$

(2) $3abc-4abc+16abc-7abc$

(3) $xyz-3xyz-7xyz+15xyz$

(4)
$17cde$
$-cde$
$-13cde$
$5cde$

(5)
$a+b+c$
$3a-2b+3c$
$-7a+5b-7c$
$a-b-4c$

(6) A has $2x$ pounds and y shillings.
B has $3x$ pounds and $2y$ shillings.
C has $15x$ pounds and y shillings.
How much had they in all?

(7) $\frac{3a}{2}-\frac{3a}{4}-\frac{3a}{2}+\frac{5a}{4}$

(8)
$\frac{3a}{2}-\frac{1}{4}b+5c$
$\frac{a}{2}+\frac{3}{4}b-5c$
$a+b+c$

(9)
$\frac{a}{2}-\frac{b}{2}-\frac{c}{2}$
$-\frac{a}{4}+\frac{b}{4}-\frac{c}{2}$
$-\frac{a}{4}+\frac{b}{4}+c$

(10) Find the sum of the following (remembering that all within a bracket is to be regarded as one quantity):—

$+16(a+b)$
$-5(a+b)$
$+7(a+b)$
$-9(a+b)$

III. The addition of Unlike Terms. Rule.—Simply write down the Terms, each preceded by its proper sign.

It is *usual* to arrange the terms in the order of their letters.

Thus the sum of xy, $-ab$, and $+a$ is $a-ab+xy$.

NOTE.—If some terms are alike, and others unlike, add together the like terms by Rules I. and II., and then write down the unlike terms according to Rule III.

Thus :—

$$\begin{array}{l} 5a+3a^2b+5xy+z \\ 6a-a^2b-5xy-y \\ 3a-4a^2b \qquad -x \\ \hline 14a-2a^2b \quad * \quad -x-y+z \end{array}$$

In this example it will be noticed that the first column is added by Rule I., the second by Rule II., the third has a star underneath to indicate that the terms $+5xy$ and $-5xy$ destroy or neutralize one another, and the fourth column, consisting of unlike terms, cannot be added but must be simply brought down, as we have said in Rule III.

EXERCISE VII.

Find the sum of

(1) $3x$, $4y$, and $5z$.

(2) $3a$, $-5b$, $-6bc$, and $4d$.

(3) $2a+b-c+3d$, $3a+2b-3c+e$, $b+3a-f$, and $a+b+c-d$.

(4) $4x^2+3y^2+5z^2$, $5y^2+3x^2-7z^2$, $3x^2-5y^2-3z^2$, and $5x^2-7y^2+3z^2$.

(5) Simplify by collecting the like terms,
$3a+4b-3c+d-2a-3d+4c-6a+7$.

(6) Add together :
$x^2+2ax+a^2$, $x^2-2ax+a^2$,
$x^2+2bx+b^2$, and $x^2-2bx+b^2$.

(7) Simplify by removing brackets and collecting like terms :
$\{a+5b-(3c+d)\}-\{4a-5b-(3c+6d)\}$.

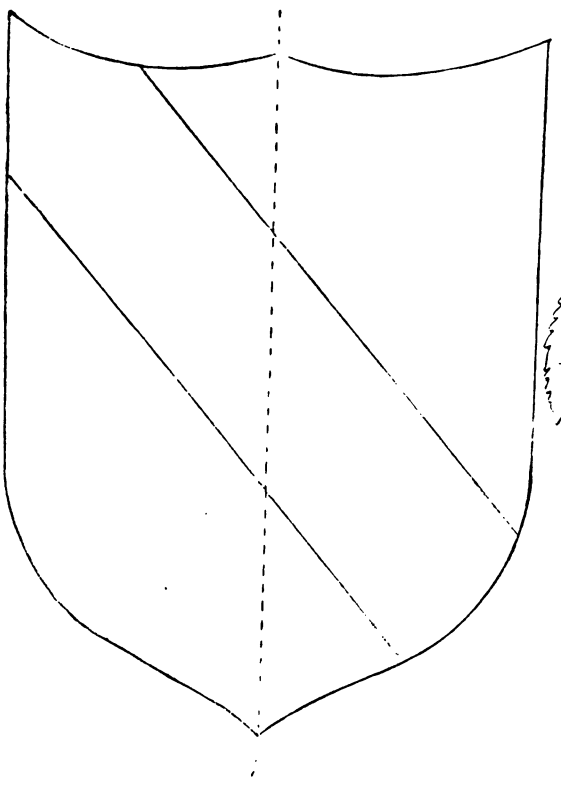
(8) Simplify :
$6a+\{d-(5c-b)\}-\{a-(b-c+2d)\}$.

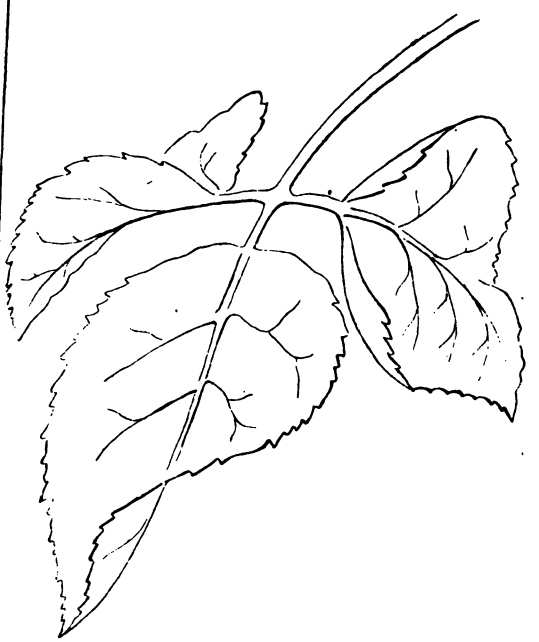
(9) Add together (remembering that all within a bracket is counted as *one* quantity)—
$7(a+b)+6(c+d)$, $9(a+b)-5(c+d)$,
and $12(a+b)-16(c+d)$.

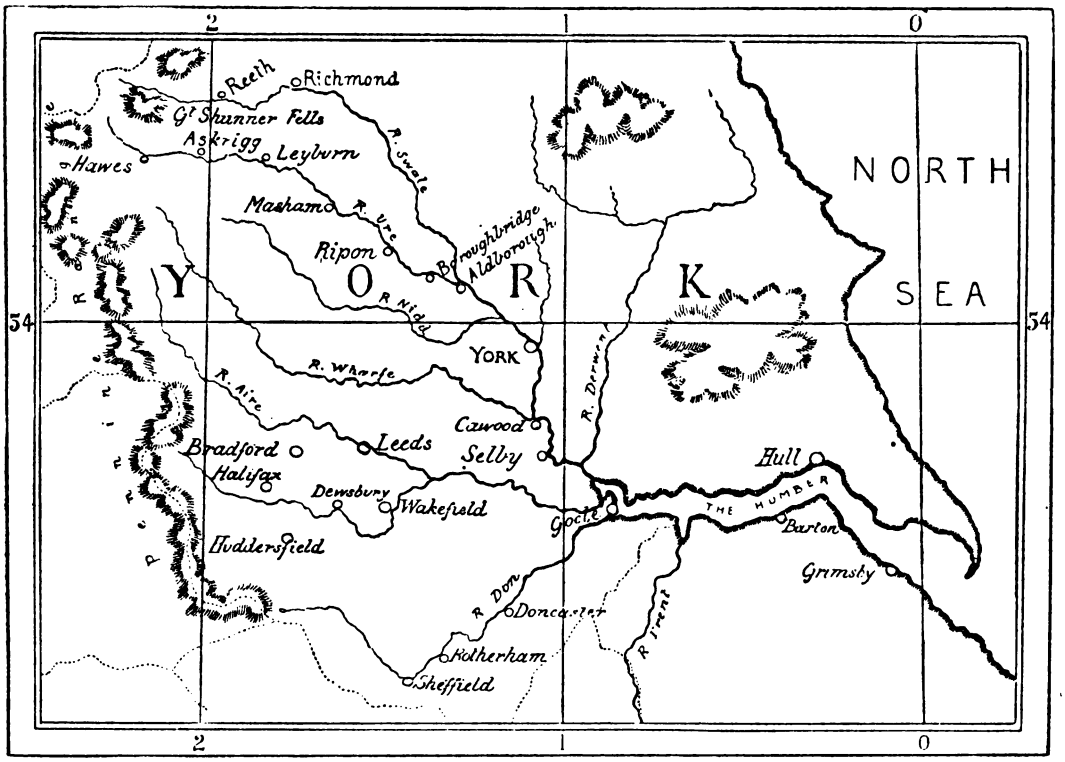
(The Answers to the Arithmetic and Algebra appear in the June number of the *Practical Teacher* and the *Governess*.)

Complete Answer Cards may also be had price ½d. each.

Freehand Drawing Copies.







Up our Rivers.

IV.—THE YORKSHIRE OUSE.

THIS river is about 140 miles long if we reckon the source of the Swale as that of the main stream; and with its tributaries drains almost the whole of Yorkshire.

In our last issue, when tracing the course of the Trent from the sea to its source, we said that the Humber was formed by the junction of that river with the Ouse, and that in going up it from Spurn Head, we passed the towns of Great Grimsby, Hull, and Barton.

We shall not go over this part of our journey again, but shall commence our description of the Yorkshire Ouse at the point at which the Trent joins it.

At first we proceed due west until we come to Goole, a town possessing a considerable trade in shipping, situated on a flat stretch of country by the west bank of the river. Here the Don, on which are situated Doncaster, Rotherham, and Sheffield, joins us.

We then go due north for a short distance, take a sharp bend to the west, and reach the mouth of the Aire, in the basin of which river lies the great cloth-making district of Yorkshire, with its great centres, Leeds, Bradford, Halifax, Dewsbury, Huddersfield, and Wakefield.

The Derwent, a stream rising in the moorlands of the North Riding, is the next river to join us on the right, and then we come to Selby, which is a very ancient town on the western side of the river, celebrated for its old church, and for being the birthplace of Henry I.

Leaving Selby, we proceed northward, until we reach the small village of Cawood at the mouth of the Wharfe, and then a dozen more miles bring us to York.

This city is situated at the junction of the small river, the Foss, with the main stream, and was a thriving place even in the old Roman days. It was then called Eboracum, and was surrounded by strong walls, which still exist in a good state of preservation.

The cathedral is one of the finest in the kingdom.

From York we proceed still in a north-westerly direction, and, after passing the mouth of the Nidd, reach the village of Aldborough, at the junction of the Swale and Ure—the two streams, which by their union form the Ouse.

First proceeding up the Swale, the more northern of the two, we find it passes Richmond with its fine old castle, and Reeth, and rises in the wild moorlands on the confines of Westmoreland and Yorkshire.

The chief points of interest on the Ure are Boroughbridge (near which Edward II. defeated the rebel Earl of Lancaster in 1322), the old cathedral city Ripon, and the country towns of Masham, Leyburn, Askrigg (with lead mines), and Hawes.

The two last named are situated in Wensley-dale, a district celebrated for its cheeses.

Ure Head, as the source of the river is called, lies on the confines of the two counties, York and Westmoreland, among the spurs of the Great Shunner Fells.

SUMMARY.

Source	On the confines of Yorkshire and Westmoreland.
General direction ...	South-east.
Length	About 140 miles (from the source of the Swale).
County through which it flows	Yorkshire.
Tributaries on right bank (assuming the Swale to be the main stream, ...	Ure, Nidd, Wharfe, Aire, and Don.
Tributaries on left bank	Foss and Derwent.
Towns on its banks	Reeth and Richmond (on Swale); Hawes, Askrigg, Leyburn, Masham, Ripon, and Boroughbridge (on Ure); Aldborough, York, Cawood, Selby, and Goole.

Arithmetic. BY W. SPENCER.

STANDARD III.

A. 1. Divide 641285 by 17.
2. „ 902486 by 37.
3. „ 9417007 by 705.

B. 1. $(57609 \times 500) \div 125$.
2. $(8176413 - 93,528) \div 800$.
3. $(7618275 \div 25) \div 376$.

C. 1. Divide nine million sixteen thousand and forty by 381 – 47.
2. Take £76 5s. 7½d. from £800.
3. Find the sum of £346 17s. 8½d., six thousand and twelve pounds fourteen and ninepence halfpenny, £7106 18s. 4¾d., seventeen shillings and tenpence, five thousand pounds eight shillings and three farthings, and £8176 14s. 9¾d.

D. 1. Bring 617825 farthings to £.
2. How many farthings in £609 17s. 8¾d.?
3. How many boys could each receive 2½d. out of £17 12s. 6d.?

E. 1. If marbles are 1½d. a score, how many *thousand* could be bought for £5 6s. 3d.?
2. Fifty-seven thousand and nineteen farthings is how much more or less than 973 half-crowns?
3. $(67809 \times 5080) \div 84016$.

F. 1. Divide seventy million fourteen thousand and six by the sum of all the *teens* multiplied by 305.
2. Take £3018 17s. 8¾d. from five million eighteen thousand and forty-six three-halfpences.
3. £638 + 719 cr. + 938 fl + 705d.

ADVANCED EXAMINATION.

1. Divide £8 15s. among 120 boys and 80 girls so that each girl may receive 2½d. more than a boy. How much will each boy and girl receive?
2. In a school consisting of 280 scholars, half of them pay 4d. each a week, a fourth of the remainder pay 5d. a week, 60 pay 6½d.; a third of those still left pay 8d., 20 pay 9d., and the rest pay 10d. a week; what will the fees amount to in a year of 46 weeks?
3. A draper sold goods in January to the amount of £238 14s. 7½d., in February £79 16s. 0½d. less than in January, in March £48 17s. 10½d. less than February, and in April just half the amount taken in the three previous months. How much did he take in the 4 months?

STANDARD IV.

A. 1. Multiply £85 17s. 6¾d. by 24.
2. ,, £93 15s. 8½d. by 63.
3. Divide £6179 14s. 2½d. by 21.

B. 1. £767 16s. 10½d. × 37.
2. £61783 17s. 2½d. ÷ 476.
3. Bring 78 tons 14 cwt. 3 qr. 19 lb. to lbs.

C. 1. Divide £761 14s. 9½d. by 86019.
2. Bring five million twelve thousand and fourteen ounces to tons, cwts., etc.
3. Find the cost of painting on *both* sides 7 doors, each side containing 1 sq. yd. 6¼ sq. ft. at 2½d. a sq. foot.

D. 1. Bring 67183517 seconds to weeks, days, etc.
2. If a man earns 4s. 7½d. a day, in how many weeks of 5½ days each could he earn £122 2s.?
3. What would 9½ tons of coal cost, if 2½ tons cost £1 17s. 11d.?

E. 1. How many square feet are there in 20¼ square miles?
2. How many girls' dresses, each requiring 7 yds. 2 qrs. 1 nl., can be made out of 42 pieces of material, each piece containing 38¼ yards?
3. Multiply £6 17s. 3¾d. by 827.

F. 1. How many minutes are there from April 17th at 4.21 p.m. to October 12th at 11.16 a.m.?
2. If a bullock be worth 6 sheep, and if 7 sheep be worth £26 15s. 6d., what are 38 bullocks worth?
3. From five and three-quarter miles take three thousand and nineteen yards, and give the remainder in inches.

Advanced Examination.

1. Supposing a man to eat 1¾ lb. of bread a day, a woman 1¼ lb., a boy 1 lb., and a girl ¾ lb.; and that 5 lb. of flour will make 6 lb. of bread;—find the quantity of flour in tons, cwts., etc., that will be required in a year for 500 men, 400 women, 680 boys, and 620 girls.
2. If 127½ cwt. of hay be eaten by 112 horses and 118 cows in 5 days, and if a horse eats 10¾ lb. a day, —how much did each cow eat per day?
3. A waggon, when filled with 56 bags of coal, weighs 2¾ tons, the waggon itself weighing 11½ cwt. How many lbs. of coal does each bag contain, supposing an empty bag to weigh 2¼ lbs.?

STANDARD V.

A. 1. 2061 balls at ½d. each.
2. 8075 balls at 1½d. each.
3. 17807 balls at 2½d. each.

B. 1. 8176 balls at 8¾d. each.
2. 29809 balls at 3s. 3¼d. each.
3. 4817 balls at 7s. 10½d. each.

C. 1. 7295 tons at £1 17s. 9½d.
2. 8179¾ tons at £4 17s. 7d.
3. 18 tons 13 cwt., 2 qrs. 21 lbs. at £4 17s. 4d. a ton.

D. 1. What would 931 lbs. cost at £3 17s. 10d. a *cwt.*?
2. If 150 oranges cost 4s. 9d., what would 20 boxes cost, each containing 7½ gross of oranges?
3. What would 23½ million pins cost, at 1s. 1½d. per thousand?

E. 1. A bill:—3¼ yards, at 7s. 5d., 17⅛ yds. at 11s. 10½d., 68½ yds. at 4½d., 2⅝ yds. at 12s. 6d., 150 yds. at 10½d., a *dozen* yds., and $\frac{7}{16}$ yd. at a guinea a yard.
2. What would 18 tons 15 cwt. 3 qrs. 21 lbs. of flour cost, at 2s. 2½d. per *stone* of 14 lbs.?
3. What would 83,775 articles cost, at 1s. 7d. a score?

F. 1. If 160 marbles cost 6½d., how many could be bought for 9s. 5¾d.?
2. What would 8 lbs. 10 oz. 16 dwt. 18 grs. of silver cost, at 4s. 6d. an *ounce*?
3. Make out the following bill in proper form, and then receipt it:—8 hams each 28 lbs. at 5½d. a lb., 10 flitches each 42 lbs. at 4½d. a lb., 25 kegs of lard each 18 lbs. at 4¼d. a lb., and 14 cheeses each 22 lbs. at 5d. a lb.

Advanced Examination.

1. A horse dealer bought 500 horses for 11000 guineas, in addition to which they cost 1½ guineas each in expenses. He sold 300 of them at 30 guineas each, 150 at 22½ guineas each, and the remainder at £18 10s. each;—how much did he gain or lose on the lot?
2. Find the value of 862 tons, 16 cwt. 44 lbs. of hay, at £4 17s. 8d. a ton.
3. Make out the following bill for repairing a house:—7 masons each 8 days of 9½ hours at 7d. an hour, 10 bricklayers each 7 days of 9 hours at 6½d. an hour, and 6 joiners each 11 days of 10 hours at 5¾d. an hour.

STANDARD VI.

A. 1. Add together $\frac{5}{8}$, $\frac{3}{4}$, $\frac{5}{6}$, and $\frac{7}{12}$.
2. From $6\frac{5}{8}$ take $\frac{3}{4}$ of $5\frac{5}{6}$.
3. Divide $\frac{5}{6}$ of $2\frac{1}{4}$ by $\frac{7}{8}$.

B. 1. How much is ·0875 of £3 10s.?
2. Multiply 4·185 by ·045, and divide the product by ·005.
3. Bring the sum of £·085 and ·435 cr. to the vulgar fraction of 4s. 6d.

C. 1. What would 80 yards of cloth 42 inches wide cost, if 50 yards 60 inches wide cost £18 10s.?
2. If 40 planks 15 feet long 10 inches wide and 3 thick cost £7 15s., find the price of 65 planks each 10 feet long 12 inches wide and 2½ inches thick.
3. $(7\frac{5}{8} + 12\frac{5}{6}) \div (\frac{7}{8} - \frac{5}{6})$.

D. 1. What would 7·145 cwt. of sugar cost at £·0095 a lb.?
2. If *A* can mow an acre of grass in 7 hours, and *B* in 8, in what time could they together mow 1⅞ acres?
3. If £17·425 be divided equally among 40 men, what decimal of 17s. 6d. would each receive?

STANDARD VI.—*Continued.*

E. 1. Divide the sum of $6\frac{1}{4}$ and $3\frac{1}{2}$ by their difference.

2. From ·075 week take 7·245 hours, and give the answer in the v. f. of a day.

3. If 60 men in 8 days of 10 hours each earn £45, how much would 80 women earn in 12 days of 8 hours each,—10 women being equal to 7 men?

F. 1. Divide the difference between 8·15 and ·00815 by ·0125.

2. If $4\frac{1}{2}$ cwt. of sugar cost £$5\frac{5}{8}$, what fraction of a lb. would cost $1\frac{3}{4}$d.?

3. What would ·175 cwt. of tea cost, if $2\frac{1}{2}$ oz. cost 6d.?

ADVANCED EXAMINATION.

1. *A* can make a coat in $21\frac{1}{2}$ hours;—he works at it alone for 9 hours, and then *B* helps him to finish it. Supposing the coat to be finished in 15 hours from *A* commencing, in what time could *B* have done it alone?

2. Find the cost of supplying a school containing 210 writers with ink for a year of 44 weeks of 5 days each, each scholar requiring on an average ·0015 pint of ink per day, at 2·95s. a gallon.

3. If 7 men *or* 10 women eat 60 lbs. of bread in 5 days, how long would 400 lbs. of bread serve 16 men *and* 12 women?

STANDARD VII.

A. 1. S. interest of £780 for 3 years, at 5 per cent. per annum?

2. S. interest of £896 12s. 6d., at 4 per cent. for $2\frac{1}{2}$ years?

3. At what rate per cent. would £850 amount to £925 in 3 years, simple interest?

B. 1. Find the interest of £650 17s. 6d. for 100 days, at 4 p. c.

2. In how many years would £675 amount to £800, at 8 per cent., simp. int.?

3. What principal would amount to £400 in 3 years, at 4 per cent., simp. int.?

C. 1. In how many days would £85 make £1 interest at 3 p. c.?

2. Out of 285 scholars, 11 were late;—what is the percentage?

3. A man can run $2\frac{1}{2}$ miles in 21 minutes, and a boy can run $1\frac{1}{2}$ miles in 17 minutes:—find the ratio of their speed.

D. 1. What would £375 amount to in 3 yrs. 50 days, at $4\frac{1}{2}$ per cent., simp. int.?

2. Find the compound interest of £880 for 4 yrs., at 5 p. c.

3. Find the length of the side in yards of a square field that contains $6\frac{1}{4}$ acres.

E. 1. Give the exact date of 317,029 minutes reckoned backwards from Dec. 25th, at 7.35 a.m.

2. Find the discount on £850, paid six months before due, at 5 per cent.

3. At a collection made in a congregation of 680 persons, 3 persons gave £1 each, 7 gave 10s., 20 gave 2s. 6d., 120 gave 1s., 200 gave 6d., 240 gave 1d. each, and the remainder gave nothing:—what was the *average* given by the whole congregation?

F. 1. What annual income would be got by investing £18,500 in the 3 per cents. at $92\frac{1}{4}$?

2. What would £750 amount to in 3 years at 4 per cent., *compound* interest?

3. Find the present worth of £85 paid 120 days before due, at 4 per cent.

ADVANCED EXAMINATION.

1. A draper bought 480 yards of cloth for £300. He sold one-half of it at a profit of 20 per cent. on its prime cost, 100 yards at a profit of 10 per cent., and 60 yards exactly at their cost price:—at what price must he sell the remainder per yard to make a profit of 15 per cent. on his entire outlay?

2. I owe an account £67 10s., payable in 8 months, for which I pay prompt cash £65:—what rate per cent. per annum discount am I allowed?

3. A person buys a house for £400, and borrows the money at 5 per cent. He applies £80 a year in paying the interest and reducing the amount borrowed at the *end* of each year:—how much will he owe at the end of the fourth year?

The Pith of a Course of Domestic Economy Lessons.

BY MRS. WIGLEY,

Author of 'The Marshfield Maidens,' etc.

LESSON XIII.

IT is a good thing to think well over that which puzzles us. I hope some of you are feeling puzzled over some of the things these little lessons have spoken about. For instance, we have said a good deal about the needs of the body.

1. Its bones must be kept strong.
2. Its flesh must be kept plump.
3. Its blood must be kept pure.
4. It must not be allowed to get cold.

And we also said that all this work had to be done by the food we eat.

Now all who are good thinkers have begun to puzzle over this; they have talked to themselves in this fashion—

What sort of food will make the bones strong? What must I eat to make the flesh plump? How

am I to know what will keep the blood pure and the body warm?

And then another puzzle will come also, and you will want to ask some one—

When I do know about the right kind of food, how is it to be got to the place where it is most needed?

LESSON XIV.

YES, these are all puzzles at first. But you must keep on thinking till you have learned all about it. Think now for a little while.

One of these lessons told you how you ought to repair anything. You would first examine what the article was made of, and you would know that you must get some of the same material to use again, or you would not be able to make a good job of it. Suppose you had to repair a cloak made of satin, and trimmed with beads and fringe, and lined with silk. Well, if the lining was worn you would not mend it with beads, nor fringe either. You would mend silk lining with silk lining, and bead trimming with bead trimming, and fringe with fringe.

Or suppose you had a little fountain in your garden, and that you wanted the water to keep on playing day and night. If the water was all dried up, what use would it be to shovel in a lot of sand?

In the same way you would not feed a fire with bricks or stones. You would find out where the coal was kept and use that.

LESSON XV.

YES, that is the most important question to ask—Where shall we find the right thing to feed the fire and the fountain with, so that they may continue to do their work?

When once we know what is wanted, where it is kept, and how to get it to the right place, we have learned a great deal.

Now apply this to our bodies. Just what we find in the different parts of the body, we must put into the body in our food.

Because we find lime in our bones, we must have food with lime in it to feed the bones. If we find jelly in our sinews and gristle, we must eat jelly to feed the sinews.

When you come to learn how many strange things are found in the different parts of our bodies, you will understand directly that those same strange things must also be found in the food we eat.

LESSON XVI.

AND we said something about another puzzle also. How is the lime in the food to be got to the bones?

All the food which the different parts of the body need to feed them, has to be *floated* to the right place in the blood. Perhaps you have heard that some of our blood-vessels are very tiny indeed—much finer than a hair. And it is through tubes as tiny as this that the food has to pass.

You cannot prick your finger with the finest needle but you will pierce through the walls of several of these tiny tubes which we call blood-vessels, and you see the blood flow out.

How can our bread and butter and meat and pudding be made to do this?

We must learn the right answer to this puzzle also.

Dictionary.

EXPLANATORY LIST OF THE MORE DIFFICULT WORDS OCCURRING IN THIS NUMBER.

Bishopric, the office and jurisdiction of a bishop; a diocese.
Blithe, joyous, merry.
Canons of criticism, the laws which regulate the science of judging poetry, pictures, etc.
Chaise, a light carriage.
Covenant, an agreement or bargain.
Crescent, a figure resembling the new-moon, used as a standard by the Turks.
Crusades, an expedition under the banner of the *Cross* to recover the Holy Land from the Saracens.
Desultory, rambling, aimless.
Duffil-grey, a thick grey cloth made of wool.
Effectually, successfully, thoroughly.
Exploits, great actions.
Homage, the submission and service which, under the old feudal system, a tenant promised to his liege lord.
Hostages, those who remain with the enemy as a pledge for the fulfilment of a treaty.
Infidel, not believing in Christianity.
Intimacy, close friendship.
Law-agent, a lawyer who acts as agent for another person.
Lyrical, written in stanzas, fitted to be sung.
Mosque, a Mohammedan place of worship.
Pacified, calmed, made peaceful.
Passport, a written permission to pass.
Patriarch, the head of the Christian Church at Jerusalem.
Permanent, lasting, enduring.
Philosophy, a particular system of reasoning.
Pilgrimages, journeys undertaken from religious motives.
Post-boy, a boy who rides *post*-horses.
Ruby, a precious stone of a red colour.
Sepulchre, a place of burial; a tomb.
Sheriff, an officer in a county who sees to the due execution of the law.
Surrender, to give one's self up.
Unsubstantial, not real.
Visionary, dreamy.
Yoke, a mark of servitude; slavery.

WORDS, SOMEWHAT DIFFICULT IN SPELLING, NOT OCCURRING IN THE ABOVE LIST.

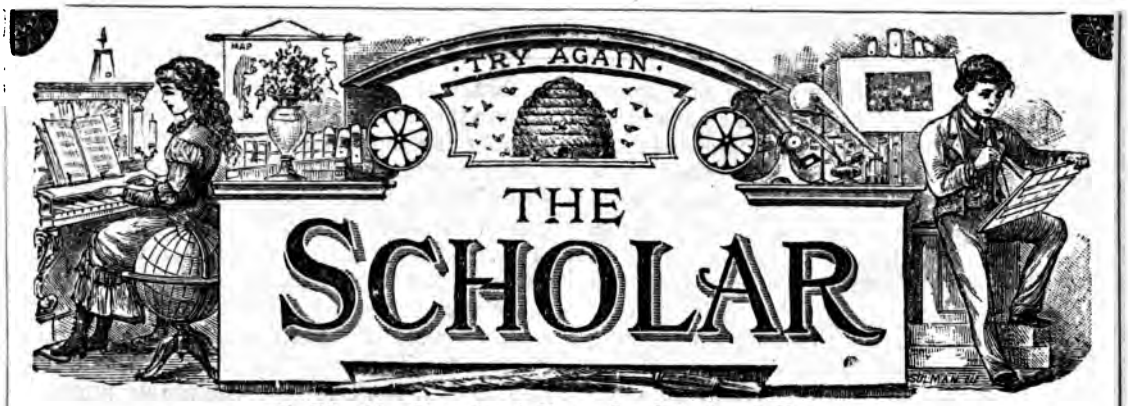
Acquaintance.	Heir.	Orphan.	Shield.
Answered.	Jewel.	Quarrels.	Siege.
Babblings.	Language.	Recognised.	Slaughtered.
Dungeon.	Leapt.	Rescue.	Tattered.
Eager.	Lonesome.	Revolutionary.	Tavern.
Earldom.	Minstrel.	Scarecrow.	Taxed.

MAKE HAY WHILE THE SUN SHINES.

Words by GEO. BENNETT. *Music by* T. CRAMPTON.

Moderato. mf
1st TREBLE.
2nd TREBLE.
BASS.
1. There's a pro-verb fa-mil-iar to young and to old, Which a-mong the most gold-en of
2. In the great field of life there is much to be done, There's a work to ac-com-plish—a
KEY F. Moderato. mf
1st TREBLE.
2nd TREBLE.
BASS.
max-ims we hold, That in la-bour or learn-ing no tri-fles should stay, But while the bright
prize to be won; For with com-peers and ri-vals who brook no de-lay, We must toil while the
C. t.
sun shines be mak-ing the hay. In the spring-tide of hope, in the morn-ing of youth, We must
bright sun is rip-'ning the hay. There is more to be done than in times that are past, And but
f. F.
e-ver be ear-nest for knowledge and truth; Working on with a will as the hours pass a-
small is their chance who would lag with the last; With the fore-most we'll strive in the morn-ing of
Symph.
-way, And toil while the sun shines to make up the hay.
day, And while the bright sun shines be mak-ing the hay.
Symph.

LONDON: PUBLISHED BY JOSEPH HUGHES, PILGRIM STREET, LUDGATE HILL.



A Monthly Educational Paper for School and Home.
Conducted by JOSEPH HUGHES.

No. 5. Vol. I. JULY, 1882. [Price ½d. Per post, 13 copies for 7½d.

CONTENTS.

1. Stories from English History 49
2. Gems from the Poets 51
3 Algebra 53
4. Freehand Drawing Copies 54
5. Up our Rivers.—V. The Great Ouse. With Map .. 55
6. Dictionary 56
7. Writing Competition Prize List 56
8. Arithmetic for Standards III., IV., V., VI., VII. .. 57
9. Domestic Economy 59
10. Music 60

Stories from English History. 5.—Edward the First and William Wallace.

BY THE REV. SIR G. W. COX, BART., M.A.

IN spite of the long struggle which the barons had been compelled to maintain against King John and his son Henry III., the growth of the English nation is shown in the great efforts made by Edward I. to bring the whole of Britain under his

[ALL RIGHTS RESERVED.]

dominion, and by the measure of success which he achieved both in Wales and in Scotland. How far he was justified in the claims which he made upon either, is a question which it is in one sense very difficult to answer, and in another sense very easy. The king of England declared that the Scottish and Welsh princes had in times long past sworn fealty to kings who were then seated on the English throne; and it will make little difference if we allow that the facts may have been as he said they were. It is quite possible that Scottish and Welsh princes may have declared themselves the 'men' of English sovereigns, and pleas very good in law might be drawn from those admissions, if those admissions were in themselves worth anything. So long as a country is in the hands of a despot, these pleas may be worth a good deal; but in proportion as the people of the land are awakened to the need of self-government, they lose their value; and we should say that any engagement by which an English king or queen should now admit the superiority of any other sovereign would be in itself null and void. We should not allow their right to make the engagement, and we should say that it had no more force than the oath which William the Conqueror made Harold swear over the chest of relics at Rouen.

We can therefore read the story of King Edward's achievements in Wales and in Scotland without forming any foolish notions of the superiority of one set of people to another. None of the actors in these old stories were altogether upright, straightforward, and honest. The Welsh chief may have tried to escape an obligation which he allowed to be a real one, but King Edward did not scruple to tempt by a bribe the faith of the Welsh king's brother; and so the struggle went on with more or less of craft, fraud, and treachery, as well as violence, on both sides, until it ended in the way in which it was best for the happiness of all within the island that it should end. It is quite certain that such a country as Great Britain could not be split up into three kingdoms, hostile to each other, without causing constant and fearful misery.

But it was scarcely to be expected that either Welshmen or Scotchmen should see this in the days of William the Conqueror or even of Edward I., while it was very natural that they should be led to regard those who professed to defend their rights with a reverence much greater than they deserved. This was the case, we cannot doubt, with the Scottish champion known as Sir William Wallace, who betook himself to the woods, not from any sense of burning wrongs done to his countrymen by the English king, but because he had committed murder. For some time he and the followers whom he got together lived by mere midnight thieving, until the issue of a chance fight, in which the Sheriff of Lanarkshire was killed, made his name more widely known. Others then rose up against the English, or against those who favoured the English in different parts of the land; and all these joined their forces, and so made up a large army. Wallace's next success was over the Earl of Surrey, whom Edward I. had left as guardian of the kingdom. The earl foolishly allowed his men to cross over a stream by a bridge on which only two could move abreast; and when some four or five thousand had so crossed, Wallace ordered his own army, which was immensely larger, to march down and slaughter them.

But Wallace underwent a defeat as signal as this victory when Edward himself advanced against him. In the battle of Falkirk (1298) forty thousand Scotchmen, it is said, were slain; but however this may have been, the career of Wallace as a general was at an end. He went back to his forests, although he was invited, like all the other Scottish chiefs, to throw himself on Edward's favour, and Edward's behaviour to the governor of Stirling Castle shows that he would have been honourably treated. For ninety days the governor of Stirling Castle had foiled the efforts of the

English king, who was moreover exposed to great danger during the siege; and when at length further resistance became impossible, the governor with twenty-five men went down, barefooted, and with ropes round their necks, to pray for Edward's favour. 'I have no favour for you,' was his answer; 'you must surrender at my pleasure.' On their assenting, he then said, 'My pleasure is that you be hanged as traitors.' 'Sir,' replied the governor, 'we admit our guilt, our lives are in your hands.' 'And what do you say?' he asked, turning to the rest. When all allowed that they were guilty, Edward ordered them to be taken as prisoners, but not in chains, to England.

Wallace did not remain long at large; and the reason for his capture shows what manner of man he was. His place of hiding was betrayed by one of his followers, whose brother he had murdered, to the governor of Dumbarton, who surprised him in his bed (1305). Wallace was taken to London, and tried in Westminster Hall, for treason, murder, and robbery. The two last charges he admitted, the first he denied; and it must be allowed that he was justified in denying it. He had never admitted the authority of the English king, or sworn fealty to him, or accepted any offer from him. But this denial availed him nothing. He was condemned unjustly to suffer as a traitor the punishment which it might fairly be said that he deserved as a murderer; and so he became to his countrymen a martyr and a hero, who might, as they thought, have achieved the independence of the land, if the factions and jealousies of the nobles had not foiled his efforts and delivered him over to the power of his enemies.

Gems from the Poets.

OLIVER GOLDSMITH.

1728—1774.

OLIVER GOLDSMITH, a distinguished man of letters, was the son of the Rev. Charles Goldsmith, and was born at Pallas, in Ireland, on the 10th November, 1728. He was educated at various schools, at Elphin, at Athlone, and at Edgeworthstown, and showed some signs of genius at an early age. He was sent, on attaining his fifteenth year, to the University of Dublin, where he was admitted a Sizar of Trinity College. Here he did not distinguish himself, owing to the eccentric nature of his disposition, and the wild irregularity of his character. A quarrel with his tutor led to his leaving the University for some time, but after various wanderings and privations he returned, and seems to have led a more orderly life. In 1749 he graduated B.A. He was intended by his friends for the Church, and presented himself to the bishop as a candidate for orders; but this was refused him, on account, it is said, of his wearing a pair of scarlet breeches at the time. He then became private tutor in a

gentleman's family; but the situation proved exceedingly irksome to him, and having purchased a good horse and put thirty pounds in his pocket, he abandoned his friends without notice, and set off to seek his fortunes. Some weeks afterwards he appeared before his mother, his money all spent, his fine steed changed into a miserable hack, but he himself as full of spirits as ever. His succeeding adventures were as amusing as they were numerous. He tried the Law and Physic, but never succeeded in either profession. Having gone to Leyden, in Holland (about 1753), to study medicine, he was seized with a desire to travel through Europe, and set out for that purpose with no money and one clean shirt. He passed through the greater part of the Continental countries on foot, securing food and lodging by playing to the peasants on his flute at nightfall. He returned to London, with a few pence in his pocket, in 1755, and then, after more privations and adventures, he embarked as a *litterateur*. He made the acquaintance of Dr. Johnson and of other literary men, and did hack-work for booksellers and the magazines. In 1765 appeared his great poem, 'The Traveller,' which was received with well-merited applause. Soon after this his famous story, 'The Vicar of Wakefield,' was published. In 1770, when his second great poem, 'The Deserted Village,' was given to the world, Goldsmith may be said to have gained the highest pinnacle of his literary existence. His comedies, 'She Stoops to Conquer' and 'The Good-Natured Man' brought him in large sums of money, as did also his Histories of England and of Animated Nature; but a fatal passion for gambling, and excessive generosity always kept him poor, and he was deeply in debt at his death, which took place on the 4th April, 1774. He was only forty-five, and those who had been his intimate friends regretted him sincerely, for his kindness of heart and benevolent disposition had made him beloved by all who knew him.

J. S. FLETCHER.

THE HERMIT.

'TURN, gentle Hermit of the dale,
And guide my lonely way,
To where yon taper cheers the vale,
With hospitable ray.

'For here forlorn and lost I tread,
With fainting steps and slow;
Where wilds immeasurably spread,
Seem length'ning as I go.'

'Forbear, my son,' the Hermit cries,
'To tempt the dangerous gloom;
For yonder faithless phantom flies
To lure thee to thy doom.

'Here to the houseless child of want
My door is open still;
And though my portion is but scant,
I give it with good-will.

'Then turn to-night, and freely share
Whate'er my cell bestows;
My rushy couch and frugal fare,
My blessing and repose.

'No flocks that range the valley free,
To slaughter I condemn;
Taught by that Power that pities me,
I learn to pity them:

'But from the mountain's grassy side
A guiltless feast I bring;
A scrip with herbs and fruits supplied,
And water from the spring.

'Then, pilgrim, turn, thy cares forego;
All earth-born cares are wrong;
Man wants but little here below,
Nor wants that little long.'

Soft as the dew from heaven descends,
His gentle accents fell:
The modest stranger lowly bends,
And follows to the cell.

Far in a wilderness obscure
The lonely mansion lay,
A refuge to the neighb'ring poor
And strangers led astray.

No stores beneath its humble thatch
Requir'd a master's care;
The wicket, op'ning with a latch,
Receiv'd the harmless pair.

And now, when busy crowds retire
To take their ev'ning rest,
The Hermit trimm'd his little fire,
And cheer'd his pensive guest:

And spread his vegetable store,
And gaily press'd, and smil'd;
And skill'd in legendary lore
The ling'ring hours beguil'd.

Around in sympathetic mirth
Its tricks the kitten tries,
The cricket chirrups in the hearth,
The crackling fagot flies.

But nothing could a charm impart
To soothe the stranger's woe;
For grief was heavy at his heart,
And tears began to flow.

His rising cares the Hermit spied,
With answ'ring care oppress:
'And whence, unhappy youth,' he cried,
'The sorrows of thy breast?

'From better habitations spurn'd,
Reluctant dost thou rove?
Or grieve for friendship unreturn'd,
Or unregarded love?

'Alas! the joys that fortune brings,
Are trifling, and decay;
And those who prize the paltry things,
More trifling still than they.

'And what is friendship but a name,
A charm that lulls to sleep;
A shade that follows wealth or fame,
But leaves the wretch to weep?

'And love is still an emptier sound,
The modern fair-one's jest:
On earth unseen, or only found
To warm the turtle's nest.

'For shame, fond youth, thy sorrows hush,
And spurn the sex,' he said:
But while he spoke, a rising blush
His love-lorn guest betray'd.

Surpris'd he sees new beauties rise,
Swift mantling to the view;
Like colours o'er the morning skies,
As bright, as transient too.

The bashful look, the rising breast,
Alternate spread alarms:
The lovely stranger stands confest
A maid in all her charms.

'And, ah! forgive a stranger rude,
'A wretch forlorn,' she cried;
'Whose feet unhallow'd thus intrude
Where Heav'n and you reside.

'But let a maid thy pity share,
Whom love has taught to stray:
Who seeks for rest, but finds despair
Companion of her way.

'My father liv'd beside the Tyne,
A wealthy lord was he:
And all his wealth was mark'd as mine,
He had but only me.

'To win me from his tender arms,
Unnumber'd suitors came:
Who prais'd me for imputed charms,
And felt, or feign'd, a flame.

'Each hour a mercenary crowd
With richest proffers strove;
Amongst the rest young Edwin bow'd,
But never talk'd of love.

'In humble, simplest habit clad,
No wealth nor power had he;
Wisdom and worth were all he had,
But these were all to me.

'And when, beside me in the dale,
He carol'd lays of love,
His breath lent fragrance to the gale,
And music to the grove.

* * *

'The dew, the blossom on the tree,
With charms inconstant shine:
Their charms were his, but woe to me,
Their constancy was mine.

'For still I tried each fickle art,
Importunate and vain;
And while his passion touch'd my heart,
I triumph'd in his pain.

'Till quite dejected with my scorn,
He left me to my pride;
And sought a solitude forlorn,
In secret where he died.

'But mine the sorrow, mine the fault,
And well my life shall pay;
I'll seek the solitude he sought,
And stretch me where he lay.

'And there forlorn despairing hid,
I'll lay me down and die;
'Twas so for me that Edwin did,
And so for him will I.'

'Forbid it Heav'n!' the Hermit cried,
And clasp'd her to his breast:
The wond'ring fair one turn'd to chide,—
'Twas Edwin's self that press'd.

'Turn, Angelina, ever dear,
My charmer, turn to see
Thy own, thy long-lost Edwin here,
Restor'd to love and thee.

'Thus let me hold thee to my heart,
And every care resign:
And shall we never, never part,
My life,—my all that's mine?

'No, never from this hour to part,
We'll live and love so true;
The sigh that rends thy constant heart,
Shall break thy Edwin's too.'

Algebra.

BY W. H. HARVEY, B.A. (LONDON).

Before giving a rule for subtraction we would remind learners that in a subtraction sum written in the usual manner, *i.e.*, with the quantity to be taken away placed under the quantity from which it has to be taken, the lower line is called the SUBTRAHEND (Latin *subtrahendum*, to be taken away), and the upper line the MINUEND (Lat. *minuendum*, to be lessened).

Thus, in the following sum,

716754 is the Minuend.
679841 ,, Subtrahend.
36913 ,, Remainder.

RULE.—Change the signs of the Subtrahend and proceed as in Addition.

This change of sign is, in the following examples, fully expressed in the working, but the operation is usually performed mentally and is meant to be so done in the exercise which follows.

Example I.—Subtract $9a$ from $14a$.

Minuend $+14a$
Subtrahend with sign changed $-9a$
By Addition (Rule II.) $+5a$

Example II.—Subtract $-13xyz$ from $27xyz$

Minuend $+27xyz$
Subtrahend with sign changed $+13xyz$
By Addition $+40xyz$

Example III.—Subtract $3a-4b-3c$ from $7a-2b+c$

Minuend $7a-2b+c$
Subtrahend with signs changed $-3a-4b-3c$
By Addition $+4a-2b+4c$

The learner must remember that *Unlike Terms* cannot be really subtracted. They can only be written down with the minus sign between them. Thus we cannot subtract b from a: we can only express the result as $a-b$.

Example IV.—Subtract $7ab$ from $16abc$.

These, being Unlike Terms, must be treated as we have above described. Remember to place the sign — before the quantity which is *to be taken away from the other*. Thus the answer is

$$16abc-7ab$$

Example V.—From $a+b+c$ take $x+y+z$—

Minuend $a+b+c$
Subtrahend with signs changed $-x-y-z$
Answer $a-x+b-y+c-z$

With reference to the last example, we would remark that the sequence of the terms is immaterial. We might have equally well expressed our answer as

$$a+b+c-x-y-z$$

or, looking upon the subtrahend $x+y+z$ as one quantity, we might bracket it off and write the result as

$$a+b+c-(x+y+z).$$

EXERCISE VIII.

(1) From x take (1) y, (2) $a+b$
(2) From $16a^2bc$ take $8a^2bc$
(3) From $6a+3b-4c$ take $3a+b-c$.
(4) From $33xyz$ take $-15xyz$
(5) From $13a+6b+3c+10$ take $7a+9b-5c+9$
(6) From $5x^3-4x^2+3x-5$ take $2x^3+5x^2-7x+9$
(7) From $x+y+z$ take $a+b+c$
(8) Simplify

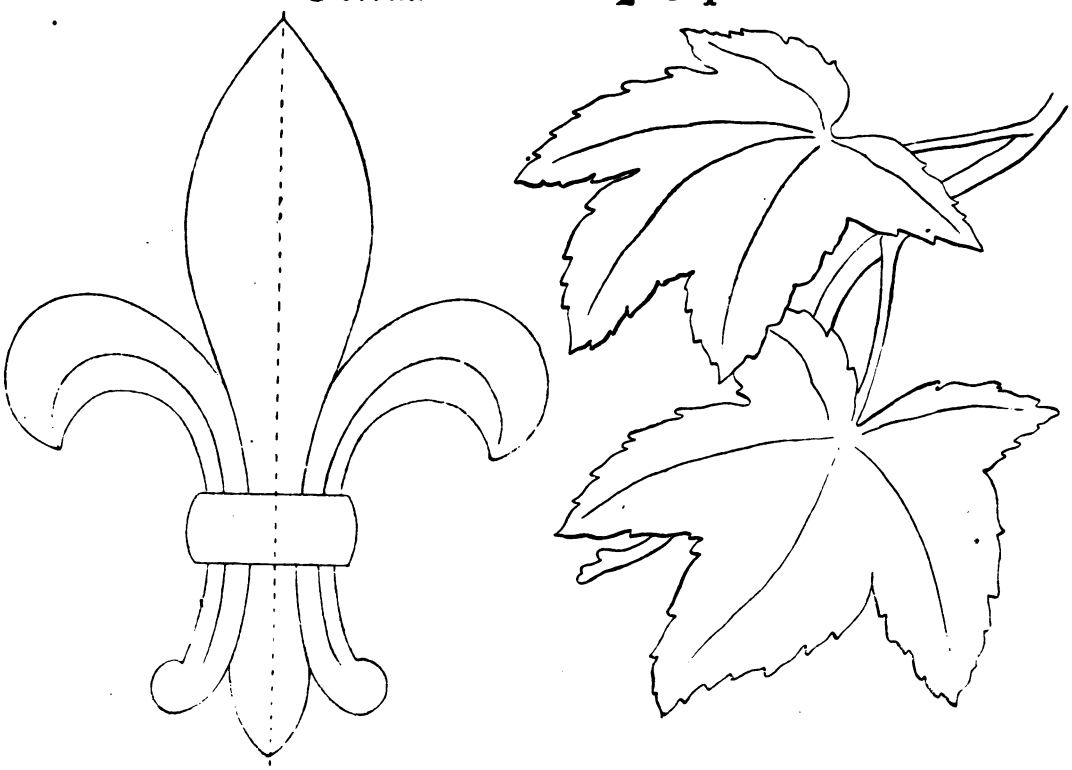
$$\{3a-(b+c)\}-(2a-b-2c).$$

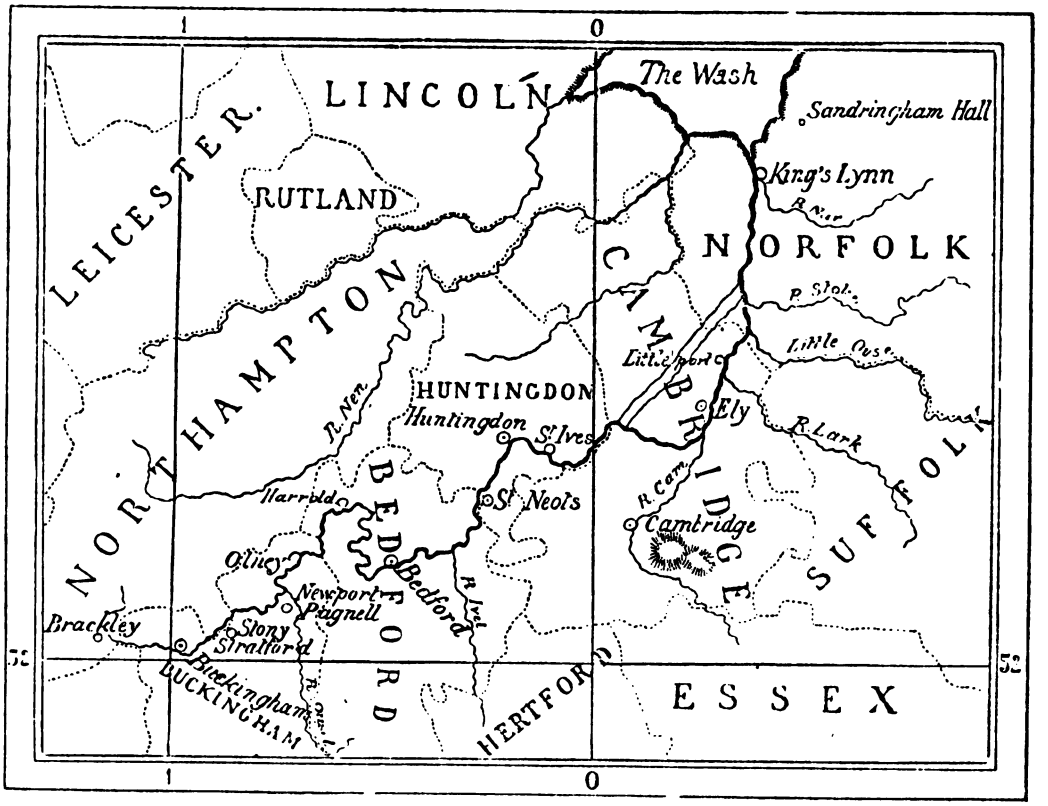
(9) A man possesses $a+b+c$ pounds: he spends on clothes $2b-c$ pounds: on boots $2c$ pounds; and on food $a-c$ pounds. How much has he left?

(10) Express in the algebraic way the difference between the *sum* and *difference* of x and y.

(The Answers to the Arithmetic and Algebra appear in the July number of the *Practical Teacher* and the *Governess*.)
Complete Answer Cards may also be had, price ½d. each.

Freehand Drawing Copies.





Up our Rivers.

V.—THE GREAT OUSE.

THE next river to which we shall direct our attention is one of those draining the eastern midland counties of England—the Great Ouse. It is about 160 miles in length, and, owing to its slow current, is navigable for the greater part of its course.

Starting from the arm of the North Sea between Lincoln and Norfolk called the Wash, and taking care to avoid the numerous sandbanks, which render the navigation of that part so difficult, we direct our course southward; and, leaving Sandringham House, the country residence of the Prince of Wales, inland on our left, we soon come to the actual mouth of the river.

King's Lynn, or Lynn Regis, the first town we reach, is a thriving seaport at the junction of the Nar, or Nore, with the main stream. It acts as a depôt for the inland traffic along the Ouse and its tributaries, and the foreign and coasting trade carried on by sea-going vessels.

Proceeding southwards, we see on the right the mouths of the Old and New Bedford Rivers (two cuts or canals nearly parallel to one another traversing the Isle of Ely and joining the river again higher up), pass the mouths of the Stoke, Little Ouse, and Lark, and the small town of Littleport, and reach Ely.

This is a very old city in Cambridgeshire, with a fine and beautiful cathedral.

Some few miles to the southward, the Ouse receives the Cam, the river on which the University of Cambridge is situated.

On entering the next county, Huntingdon, we first come to St. Ives, celebrated for its large cattle fairs, and then reach Huntingdon, at which place on April 25th, 1599, Oliver Cromwell was born.

After passing St. Neots, we enter Bedfordshire, nearly in the middle of which county is the county town, Bedford. It was here that John Bunyan lived, preached, and was imprisoned. The town still possesses some relics in the shape of his chair (which is preserved in the vestry of the chapel), and the copy of Foxe's 'Book of Martyrs' which he read in prison.

After proceeding northward past Harrold, we turn again southward, and entering Buckinghamshire reach Olney, an ancient town formerly celebrated for the manufacture of lace. A few more miles bring us past the mouth of the Ousel and the country towns of Newport Pagnell and Stony Stratford. We then reach Buckingham, and after proceeding westward find, near Brackley, in the south of Northamptonshire, the source of the river Ouse.

SUMMARY.

Source	South of Northamptonshire.	Tributaries on right bank	Ousel, Ivel, Cam, Lark, Little Ouse, Stoke, and Nar.
General course ...	North-east.	Towns on its banks	Brackley, Buckingham, Stony Stratford, Newport Pagnell, Olney, Harrold, Bedford, St. Neots, Huntingdon, St. Ives, Ely, Littleport, and King's Lynn.
Length	About 160 miles.		
Counties through which it flows ...	Northampton, Buckingham, Bedford, Huntingdon, Cambridge, and Norfolk.		

Dictionary.

EXPLANATORY LIST OF THE MORE DIFFICULT WORDS OCCURRING IN THIS NUMBER.

Achieved, finished, completed.
Career, life, course of action.
Cathedral, the church of a Bishop.
Despot, a tyrant, one who has full power.
Depôt, a place where goods are stored.
Eccentric, odd, whimsical.
Fealty, fidelity, friendship.
Factions, dissensions; quarrels.
Hack-work, chance work done at a low price.
Litterateur, one devoted to literature.
Lore, tradition, recollection.
Mercenary, greedy of gain.
Null and void, empty, worth nothing.
Pensive, thoughtful, melancholy.
Phantoms, ghosts.
Pinnacle, highest point.
Relics, remains of holy things or people.
Scrip, a small bag.
Scruple, doubt, hesitation.
Sequence, order, succession.
Sheriff, a legal functionary, the chief officer of a county.
Taper, a light, a candle.

WORDS, SOMEWHAT DIFFICULT IN SPELLING, NOT OCCURRING IN THE ABOVE LIST.

Acquaintance.	Feigned.	Legendary.	Passion.
Behaviour.	Irksome.	Medicine.	Seized.
Champion.	Jealousies.	Pleas.	Traitors.

The 'Scholar's' Writing Competition.

PRIZE LIST.

Each of the following has gained a prize of Half-a-Guinea:—

STANDARD I.
CHAS. MORRISS, Miss Goddard's School, Hitchin.
EMMA WILES, Miss Goddard's School, Hitchin.

STANDARD II.
HORACE BURROWS, Miss Goddard's School, Hitchin.
ELIZA BANKS, 19, Logan Terrace, Shepherd's Bush.

STANDARD III.
J. F. KISTRUCK, Stradbroke.
MILLICENT F. ANSELL, Miss Goddard's School, Hitchin.

STANDARD IV.
W. BASSETT, Frant School, Tunbridge Wells.
ALICE M. WATKINS, Miss Goddard's School, Hitchin.

STANDARD V.
ALFRED ROGERS, Elm Cottage, Nottingham.
SOPHIA PERKINS, Church School, Roundhay, Leeds.

STANDARD VI.
JOHN APPLEBY, Elswick Works School, Newcastle.
SARAH J. WATTS, Aylesbeare, Exeter.

JOHN R. LANGLEE, B.A., Judge.

Arithmetic. BY W. SPENCER.

STANDARD III.

A. 1. Divide 741,823 by 18.
2. $(760.214 - 89.769) \div 25$.
3. $(89,060 \times 8906) \div 265$.

B. 1. Divide 76,017,293 by 809.
2. $(7689 \times 8700) \div (84,702 - 9476)$
3. Divide six million fifteen thousand and nine by 89,703.

C. 1. Take 3s. 4½d. from £200.
2. From £802 take £87 6s. 2¾d.
3. Add together £671 14s. 8½d., four thousand and twelve pounds seventeen shillings and tenpence, 16s. 8¾d., seventy thousand four hundred and sixteen pounds, £683 17s. 8½d., nine thousand eight hundred and fifty pounds and elevenpence farthing, and £76,819 14s. 10¾d.

D. 1. How many farthings are there in £679 14s. 8½d.?
2. How many apples could be bought for £17 16s. 4½d. at 8 a penny?
3. $(76,080 \times 76,080) \div 750,800$.

E. 1. If slates are 2½d. each, how many could be bought for £6 15s. 7½d.?
2. Take 80,000d. from £800.
3. Divide forty million sixteen thousand and fifty-one by 76,489 – 7805.

F. 1. Bring nine million eighty-four thousand and seventy-thre farthings to £ s. d.
2. Take £318,763 16s. 6d. from half-a-million pounds, and bring the remainder to threepences.
3. Divide 76,418,231 by 980,793.

ADVANCED EXAMINATION.

1. From eight million sixty-one thousand and nineteen pounds and sevenpence farthing take £780,416 18s. 8½d., and bring the remainder to farthings.

2. Supposing the cost of coal by railway to be ¾d. per ton for each mile, and that a train earns £110 5s. in a journey of 140 miles,—how many tons of coal did the train contain?

3. A potato-field contains 150 rows, each 96 yards long. Supposing that each yard yields on an average 24 potatoes, and that six potatoes weigh a lb.,—find the value of all the potatoes in the field, at 1½d. a lb.

STANDARD IV.

A. 1. £768 14s. 8½d. × 25.
2. £967 18s. 9¾d. × 63.
3. £7684 17s. 4½d. ÷ 29.

B. 1. (£600 – £47 18s. 2½d.) × 81.
2. Bring 28½ tons to ounces.
3. Divide 9801 4s. 8¾d. by 367.

C. 1. Bring 81,706,183 oz. to tons, etc.
2. If 2½ tons of sugar cost £51 17s. 8½d. what would 12½ tons cost?
3. £76,083 14s. 8½d. ÷ 980 709.

D. 1. If 2 tons 4 cwt. of cheese cost £154, what would 3½ lbs. cost?
2. Bring 836 wks. 5 dys. 17 hrs. 35 min. to seconds.
3. If a shirt requires 3 yds. 2 qrs. 1 nl., how many could be made out of 40 pieces of calico each 28¾ yards long?

E. 1. A boy earns 9d. a day, and his father earns as many crowns as he does shillings,—how much will they both earn in a year of 302 working days?
2. £768 17s. 9½d. × 860.
3. If a square yard of land produces half a pint of wheat, find the value of the wheat grown on ten acres, at 8s. a bushel.

F. 1. £7,608,149 18s. 10½d. ÷ 93,085
2. 48 lb. 11 oz. 18 dwt. 17 gr. × 112.
3. A cargo of tea at 1¾d. an oz is worth £78,825 14s. 4d., find the weight of the tea in *tons, cwts.*, etc.

ADVANCED EXAMINATION.

1. A watch set to correct time on June 2nd at 1.30 p.m., gains half a minute in 24 hours,—what time will the watch indicate at 7.30 p.m. correct time on June 26th?

2. A grocer bought ten tons of currants for 300 guineas. He sold 5½ tons at 4½d. a lb. and the remainder at 3½d.,—find his gain or loss on the lot, 12 lbs. in every ton being lost in weighing out.

3. Divide 76,839 tons 13 cwt. 3 qrs. 16 lbs. 12 oz. 10 drs. by 9083.

STANDARD V.

A. 1. 7,859 books at 2½d. each.
2. 9,123 „ 4¾d. „
3. 7,635 „ 11¼d. „

B. 1. 8,759½ lb. at 9½d. a lb.
2. 26,845 „ 5s. 7½d. „
3. If 17 knives cost 9s. 8½d., what would 187 cost?

C. 1. 7,948¾ tons at 17s. 7d. a ton.
2. 8,173 „ £8 16s. 8½d. „
3. A bill:—6¾ yds. at 5s. 6d. a yd., 11¼ yds. at 4s. 9d., 30 towels at 7s. 3d. a dozen, and 8,000 pins at 2½d. a 100.

D. 1. If 16 horses are worth 68 donkeys, how many horses are 935 donkeys worth?
2. 7,649½ tons at £4 17s. 7½d. a ton.
3. 84 lb. 10 oz. 16 dwts. at £3 3s. 4d. a lb.

E. 1. 80 ac. 3 r. 36 per. at £56 10s. 8d. an acre.
2. Nine bears the same ratio to 39 as 39 does to what number?
3. A bill:—3½ tons at 6s. 3d. a cwt., 1¼ cwt. at 7½d. a lb., 24 lb. at 8s. 2d. a cwt., 5¼ tons at 2½d. a stone of 14 lb., and 2½ cwt. at 1½d. an oz.

F. 1. What would 10 miles 5 fur. 120 yds. 2 ft. 6 in. of wire cost at 1½d. a yard?

2. What would 480,000 pens cost at 9¾d. a gross?

3. Make out this bill:—400 tins of beef, each 2½ lb., at 3½d. a lb.; 680 tins of mutton, each 3 lb., at 3¾d. a lb.; 260 tins of salmon, each 1¼ lb., at 4½d. a lb.; and 840 tins of lobster, each 2½ lb., at 4d. a lb.

STANDARD V.—*Continued.*

ADVANCED EXAMINATION.

1. What would 27 tons 14 cwt. 3 qrs. 14 lb. of straw cost, if 15 cwt. 2 qrs. 20 lb. cost £1 14s. 6d.?

2. A dealer bought 150 equal-sized cheeses for £140 12s. 6d.; he sold 60 of them wholesale at a profit of 1s. 3d. each, at 50 more at a guinea each; he then sold the remainder retail at 7½d. a lb., and gained in all £18 15s. Find the weight in lbs. of each cheese.

3. A tenant rents a house at £48 a year. The poor-rate at 3s. 6d. in the £ is assessed on ⅔ of the gross rental, the gas rate at 1s. 3d. on ⅗ of the gross rental, and the general district rate at 2s. 9d. on ¾ of the gross rental. Find the total amount of rent and rates.

STANDARD VI.

A. 1. Add together $4\frac{3}{8}$ and $7\frac{1}{4}$.
2. Divide $\frac{5}{8}$ of $6\frac{1}{2}$ by $8\frac{1}{4}$.
3. Bring 2s. 8½d. to dec. of £4.

B. 1. Bring £·065 to v. f. of 2s. 3d.
2. $(81{\cdot}075 - 74{\cdot}8) \div 1250$.
3. If 8 yards of cloth 40 inches wide cost 36s. 6d., what would 15 yards that is 35 inches wide cost?

C. 1. $(6\frac{7}{16} \times 11\frac{3}{4}) \div (8\frac{1}{12} - 2\frac{3}{4})$.
2. If 3¾ lb. of sugar cost 1s., what would 7·385 cwt. cost?
3. Divide the greatest of these fractions by the least—$\frac{3}{5}$, $\frac{4}{7}$, $\frac{3}{4}$, $\frac{7}{12}$, $\frac{5}{8}$, $\frac{9}{11}$.

D. 1. If 8 men in 3 weeks of 6 days each earn £30, how much would 12 women earn in 5 weeks of 5 days each, 8 women earning as much as 5 men?
2. $\dfrac{(4\frac{7}{10} - 1{\cdot}85) + (6{\cdot}435 \div {\cdot}005)}{9\frac{1}{16} \times 18{\cdot}05}$.
3. Bring ·475 cr. to v. f. of £7·385.

E. 1. How much is $\frac{3}{5}$ of $\frac{4}{9}$ of $8\frac{1}{3}$ of $4\frac{3}{4}$ of $\frac{8}{19}$ of £7 10s.?
2. Bring 2½d. to dec. of £5000.
3. If 9 men mow 100 acres in 12 days of 9 hours each, how many hours a day must 20 men work to do 250 acres in 15 days?

F. 1. *A* can build a boat in 9 days of 10 hours each, and *B* in 8 days of 12 hours each; in how many days of 9 hours each could they together build a boat?
2. What would 5·35 tons of cheese cost at 5·9d. a lb.?
3. Divide £250 among 45 men, 60 women, and 100 boys, so that a woman receives ⅔ of a man's share, and a boy ⅖ of a woman's share; what will each woman get?

ADVANCED EXAMINATION.

1. Add together the sum, difference, and product of $8\frac{1}{4}$ and ⅔ of $5\frac{1}{4}$; then multiply the result by the quotient of the greater of these numbers divided by the less.
2. A public room is lighted by 60 gas jets, each of which consumes 4·85 c. ft. of gas per hour. They are burning on an average 3·2 hours during 180 nights; find the cost of the gas consumed at 3·35s. per 1000 c. ft.
3. If 30 logs of oak, each 12 feet long, 18 inches broad, and 8 inches thick, be worth £18, find the value of 80 logs of deal, each 20 feet long, 16 inches broad, and 12 inches thick, the value of deal to oak being in the ratio of 5 to 12.

STANDARD VII.

A. 1. Find simple interest of £487 10s. for 3 years at 5 p. c.
2. At what rate p. c. would £350 amount to £400 in 3 years?
3. In how many years would £675 amount to £780 at 4 per cent. per annum?

B. 1. A dealer bought a horse for £35, and sold him for £37 10s.; what did he gain per cent.?
2. Add 26½ per cent. to £800.
3. By selling ribbon at 9d. a yard a draper gains 18 per cent. on its prime cost; what will he gain or lose per cent. if he lowers it to 7½d. a yard?

C. 1. If the 3 per cents. are at 97½, how much must be invested to yield £390 a year?
2. What rate per cent. would be got by investing in a 4½ per cent. stock at 117½?
3. What amount of cash would be realised by selling out £4675 stock at 107½?

D. 1. Find the brokerage on £7687 10s. at 7s. 6d. per cent.
2. What would £960 amount to in 3 years at £3 6s. 8d. per cent. *compound* interest?
3. A person invests £450 at 5 per cent., £350 at 4 per cent., and £600 at 3½ per cent.; what is the average rate on the whole money invested?

E. 1. Find comp. int. on £860 for 4 years at 5 per cent.
2. Find discount of £82 10s., paid 8 months before due, at 5 per cent.
3. What sum put out at simple interest for 4 years, at 4½ per cent., would amount to £737 10s.?

F. 1. Find p. w. of £750, paid 60 days before due, at 5 p. c.
2. Find the commission on £627 10s. at £1 7s. 6d. per cent.
3. By selling 6 lb. of cheese for 3s. 8d. a grocer gained 20 per cent.; what did it cost him a cwt.?

ADVANCED EXAMINATION.

1. At the census in 1881 the population of a district was 400,000. Supposing that in each of the next five successive decades the increase is 10, 8, 5, 4, and 2 per cent. respectively, what will be the population in 1931, and what per cent. will the increase be between 1881 and 1931?
2. A school having 300 scholars on the books is open ten times in a certain week, during which 160 make the full attendances, and the remainder attend as follows:—50 attend nine times, 20 eight, 20 seven, 15 six, 10 five, 5 four, 5 three, 3 two, and the remainder none. Find the percentage of the actual on the possible attendance.
3. I owe a bill, not yet due, of £85, which I at once discharge by paying £83 10s. prompt cash, discount being allowed at 5 per cent.; how many days had the bill to run?

ERRATA.—In the May number, Standard V., E 1, read 91763¾; and in the June one, Standard V., E 1, third line, read 4½d. instead of 4¾d.

The Pith of a Course of Domestic Economy Lessons.

BY MRS. WIGLEY,

Author of 'The Marshfield Maidens,' etc.

LESSON XVII.

WE said that our food had to be floated to all the various parts of the body through very tiny channels indeed. It will not do for it to remain even in crumbs, because even a very small crumb would be too large to pass into the very small blood-vessels which we spoke of before. Let me try to make you understand how *very* small they are. You know you could not prick your finger with the finest needle but you would pierce through some of them, and the blood would begin to flow. For all the blood in our bodies is in the blood-vessels; there is none of it left loose like water in a pond. It is all confined in pipes and tubes like the water brought into the town from the reservoir, and if any of these tubes get broken or ruptured, then the blood flows out, and mischief comes of it. We call the tubes through which our blood flows, arteries, and veins, and capillaries.

LESSON XVIII.

ARTERIES are the largest. The veins lead into and out of the arteries; smaller veins lead into and out of the larger veins, and at last they end in the smallest veins of all, which we call capillaries. They must always lead *out* and *in*, because the blood keeps on flowing; it does not stop in any place, and it does not turn round and come back the same way.

Suppose you made a line an inch long, and that then you could take the ends of some of these capillaries and put them quite close together, side by side along the line, you could never guess how many you would want to fill up to the end of your line, so I will tell you. You would want 3,000 little tubes to reach an inch. And 3,000 of the largest size, too—for if you had the very little ones you would want 5,000 of them!

LESSON XIX.

So you see at once that even the very smallest crumb would not float up a passage so tiny as this. Now listen. Before our food can be carried to every part of the body, it must be *dissolved*. You know what that means. When you put a lump of sugar into your tea where does it go to? It melts or dissolves, it mixes all through the tea, and makes it all sweet alike. And if you leave it to stand it will not settle again after it has quite melted. It will have spread all through the tea, and you could not pick up ever so small a drop without its tasting sweet. Wherever that tea goes the sugar will have to go too.

This is the way your food mixes with the blood, and goes all through the blood, and is carried into the blood, wherever that blood goes.

LESSON XX.

BUT you may say, 'Everything won't mix and melt away in water like sugar does.' And you are quite right. We may put flour or starch into water and stir it for a long time, and as soon as we leave off stirring it will begin to sink to the bottom again, and the water will be as clear as before.

Or we may put a little oil or fat into some water, and we may shake it or stir it until we are tired, but as soon as we let it alone, the oil or fat will be sure to come to the top.

But these things *can* be made to mix. We can boil flour or starch in water, and then it will not settle again. And if we could change starch into sugar, it would dissolve just as sugar dissolves. It seems wonderful, but there is a something that will turn starch into sugar.

And fat can be made to mix also. Suppose you try it. Take a little oil and a little water and put it into a bottle. Now shake it up a good long time. Well, it won't mix. Now take a little piece of soda as large as the tip of your finger and drop it into the bottle, and shake again. You see that as the soda dissolves it causes the fat to mix with the water, and there is a milky-looking fluid in your bottle.

THE SQUIRREL.

Music by T. CRAMPTON.

Lively. mf

1st TREBLE.
2nd TREBLE.
BASS.

1. You can't catch me! I live in a tree, High up a-bove the ground; I
2. My food, so good, I find in the wood: A-corns and nuts, all these, I
3. Who'll live with me, So jol-ly and free, And sleep in my lit-tle nest? "Oh,

KEY G. *Lively. mf*

1st TREBLE.	.m	s	.m	:d	.m	r	,d	.t$_1$	,l$_1$	:s$_1$	.s$_1$	d	f	.s	,l	:s	.t	d'	:	.s
2nd TREBLE.	.d	m	.d	:d	.d	l$_1$		.f$_1$	,f$_1$	:s$_1$	.s$_1$	s$_1$	d	.m	,f	:s	.f	m	:	.m
BASS.	.d	d	.d	:m	.d	f$_1$		.r$_1$	,r$_1$	:m$_1$	.m$_1$	m$_1$	l$_1$	.d	,f	:m	.r	d	·	.ta,

take my rest In a lit-tle nest, So snug, and safe, and sound. I'm
tru-ly tell, I like twice as well As pie or bread and cheese. I
no!" you say, "Lit-tle squir-rel, good day! I like my home the best." Ha!

f. G.

	d'	.l	:f	.l	,l	s	,f	.m	,r	:d	.s	l	.r'	:s	.t	d'	:	.	.d'$_1$s
	f	.f	:f	.f	,f	m	,r	.d	,t	:d	.m	f	.f	:f	.f	m	:	.	.^{f}d
	l$_1$	.d	:l$_1$	.f$_1$	,f$_1$	s$_1$	,s$_1$	.s$_1$		:d	.d	f	.r	:t$_1$	.s$_1$	d	:	.	.l$_1$,r

fond of fun— I romp and run A-bout from tree to tree; When
hide my food A-bout the wood, In a-ny hole or nook; When
ha! ha! ha! You'd want your mamma, If you did live with me: 'Tis

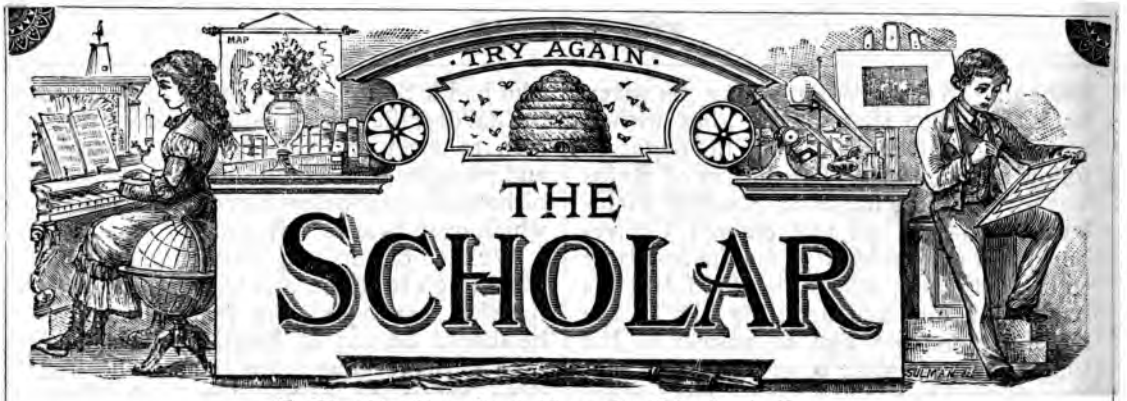
	l	.f	:r	.m	,f	s	.m	,m	:d	.r	,m	f	.r	:m	.d	s	.–	:	.m	,f
	d	.l$_1$	:l$_1$	.d		d	.d	,d	:d	.t$_1$	,d	r	.t$_1$	:d	.d	t$_1$	.–	:	.d	,r
	f$_1$	.f$_1$	:f$_1$	.f$_1$		m$_1$	.m$_1$	,m$_1$	:m$_1$	.s$_1$		r$_1$	.s$_1$	:d	.l$_1$	s$_1$	.–	:	.d	

Symph.

you pass by, I'm up so high That none of you can see.
trees are bare, I know 'tis there, And have not far to look.
bet-ter by far to stay where you are, And leave me in the tree.

Symph.

	s	,s	.m	:l	.f	s	.m	,m	:s	.m	r	.m	,f	:m	.r	d	:–	.	d'	,t	l,s	,f,m	:r	.s	d	:–
	m	,m	.d	:f	.r	m	.d	,d	:m	.d	l$_1$	.l$_1$		:s$_1$	.f$_1$	m$_1$	:–	.			d		:–	.t$_1$	m$_1$	:–
	d	,d	.d	:d	.d	d	.d	,d	:d	.d	f$_1$	.r$_1$		:s$_1$	.s$_1$	d	:–	.	.m$_1$		f$_1$	.l$_1$	:f$_1$	s$_1$	d	:–
																								m$_1$	:–
																								d$_1$	:–



A Monthly Educational Paper for School and Home.
Conducted by JOSEPH HUGHES.

No. 6. Vol. I. AUGUST, 1882. [Price ½d. Per post, 13 copies for 7½d.

CONTENTS.

1. Stories from English History 61
2. Gems from the Poets 63
3. Freehand Drawing Copies 65
4. Algebra 66
5. Up our Rivers.—VI. The Tyne. With Map 67
6. Domestic Economy 68
7. Dictionary 69
8. Arithmetic for Standards III., IV., V., VI., VII. .. 70
9. Music 72

Stories from English History. 6.—The Death of the Red King.

BY THE REV. SIR G. W. COX, BART., M.A.

ANSELM was now archbishop, and things came about just as he had feared that they would. Rufus did not die; and as his limbs regained their strength he shook off all thought of God and all care for his duty. Anselm said that all the lands

[ALL RIGHTS RESERVED]

belonging to the bishopric must be given back, and also that, if the king wished to obtain forgiveness of God, he ought to follow his counsels. The answer of Rufus was given by the hands of Randolf Flambard. Anselm had just entered Canterbury, and was on his way for the first time to the cathedral, when Flambard laid his hand upon him and arresting him in the street, summoned him to answer in the king's court for some wrong which he said that the archbishop had done. His tenants were told that they must pay their rents not to Anselm, but to the king's justiciary; and when Anselm was in this way brought to great distress for want of money, the king told him that he must have a gift or present for making him archbishop, although he had for four years been receiving money which ought all to have been paid to the primate. Anselm had no wish to quarrel with the king, and although he must have felt that he was being badly used, he managed to scrape together five hundred pounds, and offered this as his gift. But the king cast it aside with insult, and said that Anselm had no business to offer him so mean a sum. The archbishop answered gently that, although this was his first gift, it would not be the last, if the king would only treat him as a free man. 'If you will treat me as a slave,' he added, 'you shall have neither me nor mine.' 'Go,' shouted Rufus in a rage, 'I want neither thee nor thine.' Anselm left; but to show that it was not stinginess which prevented him from offering more, he gave the whole of the money to the poor.

So the strife went on, for although Anselm could bear poverty for himself with patience, he could not let the king go on doing wrong upon wrong to the people over whom he was placed in charge; and the wrongs done to them by Rufus were many and grievous. When clergymen died, he kept their livings vacant, just as he had kept the archbishopric vacant, taking all the money, which really belonged to men who had little to spare, even if they lived the hardest life; nor would he allow clergymen to meet and take counsel together, and sometimes he would summon the archbishop to appear before his court for reasons which were false or ridiculous.

Wearied out at last, Anselm asked his leave to go to Rome, and he went, although the king sent to tell him that, as soon as he should be out of England, he should take all his revenue again, just as he had done before he named him archbishop. But before he set out on his journey, Anselm went to the king and said, 'Sir, I am going; but as perhaps we may not meet again, I come to offer you my blessing.' The king bowed his head, and the archbishop, after making the sign of the cross over it, in token of his forgiveness, left the room.

William lived three years longer, and he lived on in a way, if possible, more shameless than before; but he never saw the archbishop again. So great was the horror and disgust of all the people, that they began to talk about his death, which they thought must surely soon come to pass. Their talk gradually took the form of prophecies; and it would be hard to keep all those forebodings from the king's ears. His sleep, some said, began to be disturbed by horrible dreams. One night he awoke so frightened that he sent for some of his servants to keep watch near his bedside. Very early in the day some one told him of a vision which had been seen by a foreign monk, and which was thought to threaten evil to the king. 'The man dreams, like a monk, for money,' said Rufus; 'let him have it.' He had intended to go out hunting; but his people besought him so earnestly not to do so, that he gave up the thought of it. At dinner he ate and drank largely, and, cheered by the banquet, rode out into the New Forest. There, one after another, whether by chance or by fixed plan, his attendants left him; and as the sun went down, he was found by some countrymen weltering in his blood, dead or almost dead. An arrow had pierced his

breast, and the shaft was broken. The men put his body in a cart, and took it to Winchester. The next day it was laid in a grave in the cathedral, but no bell was tolled, and no office of burial was recited over it (August, 1100).

Many stories were told of the way in which his death was brought about. Some said that while he held up his hand to shade his eyes from the sun, as he followed the track of a wounded deer, Walter Tyrrel, a French knight, drew his bow and shot him, and then, putting spurs to his horse, hurried away to the sea, and so making his escape, went as a pilgrim to the Holy Land. But Tyrrel always persisted that the story was not true, and when he came back from Palestine, he declared solemnly that he had never seen the king on the day of his death, and that he was not in that part of the forest in which he fell. What is quite certain is, that no one took any trouble to find out how he died. He had lived but forty years, he had been king for only thirteen; but he left behind him a name for daring wickedness such as could scarcely be surpassed by one whose iniquities had been spread over more than threescore years and ten.

Gems from the Poets.

LORD BYRON.

1788—1824.

GEORGE GORDON NOEL, Lord Byron, a celebrated poet, was the son of Captain Byron and Catherine Gordon, and was born in Holles Street, Cavendish Square, London, on the 22nd January, 1788. He was educated at Harrow (where he was form-fellow with Sir Robert Peel, the statesman), and at Cambridge. At the age of nineteen he published his first volume, 'Hours of Idleness,' which was favourably received by some people, but mercilessly ridiculed in the *Edinburgh Review*. To the scathing critique of the latter Byron replied in a violent satire, 'English Bards and Scotch Reviewers,' which appeared in 1809, breathing defiance on his critics, and assailing most authors of the day. In 1812 he returned from an extended tour through Spain, Italy, and Southern Europe, and gave to the world the first two cantos of 'Childe Harold's Pilgrimage.' This poem, full of fine descriptive passages, at once made its mark, and the author was hailed as the first poet of the day. It was followed, at short intervals, by a series of romantic verse tales, such as 'The Giaour,' 'The Corsair,' and 'The Bride of Abydos.' In 1816 Byron left England for the Continent, where he passed the remainder of his life. He composed, while residing in Switzerland and Italy, the last two cantos of 'Childe Harold's Pilgrimage,' 'Parisina,' 'Manfred,' 'Cain,' and many other poems and dramas. About 1818 he commenced the publication of his greatest and most remarkable work, 'Don Juan,' a poem which for powerful description and

variety of thought can scarcely be equalled. He sailed for Greece in 1823, with the intention of aiding the Greeks in their struggle for independence. In the spring of the next year he was attacked with severe illness, brought on by exposure and cold, and on the 19th April he died. His body was brought to England and buried, near the family seat, at Hucknall Torkard. Lord Byron was regarded with excessive admiration at the beginning of the century, but after his death the public drew away from his writings and treated them with neglect. Now, however, he is beginning to be read more than ever, and it is certain that he, in future times, will be regarded as one of the most noteworthy poets of the present century.

J. S. FLETCHER.

EVENING BEFORE THE BATTLE.

From *Childe Harold's Pilgrimage.* Canto III.

THERE was a sound of revelry by night,
And Belgium's capital had gathered then
Her beauty and her chivalry, and bright
The lamps shone o'er fair women and brave men;
A thousand hearts beat happily; and when
Music arose with its voluptuous swell,
Soft eyes looked love to eyes which spake again,
And all went merry as a marriage bell:
But hush! hark! a deep sound strikes like a rising knell!

Did ye not hear it? No; 'twas but the wind,
Or the car rattling o'er the stony street:
On with the dance! let joy be unconfined;
No sleep till morn, when youth and pleasure meet
To chase the glowing hours with flying feet:—
But hark!—that heavy sound breaks in once more,
As if the clouds its echoes would repeat;
And nearer, clearer, deadlier than before!
Arm! arm! it is—it is the cannon's opening roar!

* * * * *

Ah! then and there was hurrying to and fro,
And gathering tears, and tremblings of distress,
And cheeks all pale, which but an hour ago
Blushed at the praise of their own loveliness;
And there were sudden partings, such as press
The life from out young hearts, and choking sighs
Which ne'er might be repeated; who could guess
If ever more should meet those mutual eyes,
Since upon night so sweet such awful morn could rise?

And there was mounting in hot haste: the steed,
The mustering squadron, and the clattering car,
Went pouring forward with impetuous speed,
And swiftly forming in the ranks of war;
And the deep thunder peal on peal afar;
And near, the beat of the alarming drum
Roused up the soldier ere the morning star;
While thronged the citizens, with terror dumb,
Or whispering, with white lips, 'The foe! they come! they come!'

* * * * *

And Ardennes waves above them her green leaves,
Dewy with Nature's tear-drops, as they pass,
Grieving, if aught inanimate e'er grieves,
Over the unreturning brave,—alas!
Ere evening to be trodden like the grass,
Which, now beneath them, but above shall grow
In its next verdure, when this fiery mass
Of living valour, rolling on the foe,
And burning with high hope, shall moulder cold and low.

Last noon beheld them full of lusty life,
Last eve in beauty's circle proudly gay,
The midnight brought the signal-sound of strife,
The morn the marshalling in arms—the day
Battle's magnificently stern array!
The thunder-clouds close o'er it, which when rent
The earth is covered thick with other clay,
Which her own clay shall cover, heaped and pent,
Rider and horse—friend, foe—in one red burial blent!

SUNSET IN ITALY.

From *Childe Harold's Pilgrimage.* Canto IV.

THE moon is up, and yet it is not night—
Sunset divides the sky with her—a sea
Of glory streams along the Alpine height
Of blue Friuli's mountains; Heaven is free
From clouds, but of all colours seems to be
Melted to one vast Iris of the west,
Where the day joins the past eternity;
While on the other hand, meek Dian's crest
Floats through the azure air—an island of the blest!

A single star is at her side, and reigns
With her o'er half the lovely heaven; but still
Yon sunny sea heaves brightly, and remains
Rolled o'er the peak of the far Rhætian hill,
As Day and Night contending were, until
Nature reclaimed her order—gently flows
The deep-eyed Brenta, where their hues instil
The odorous purple of a new-born rose,
Which streams upon her stream, and glassed within it glows.

Filled with the face of heaven, which, from afar
Comes down upon the waters; all its hues,
From the rich sunset to the rising star,
Their magical variety diffuse:
And now they change, a paler shadow strews
Its mantle o'er the mountains; parting day
Dies like the dolphin, whom each pang imbues
With a new colour, as it gasps away,
The last still loveliest, till—'tis gone—and all is grey.

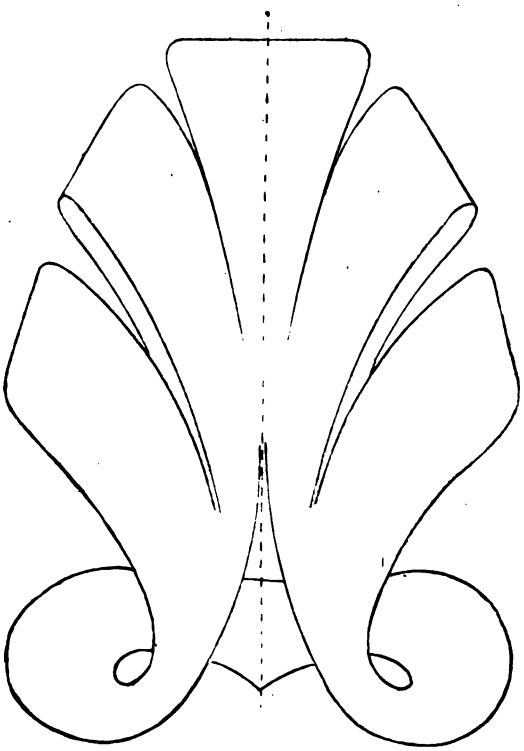
SHE WALKS IN BEAUTY.

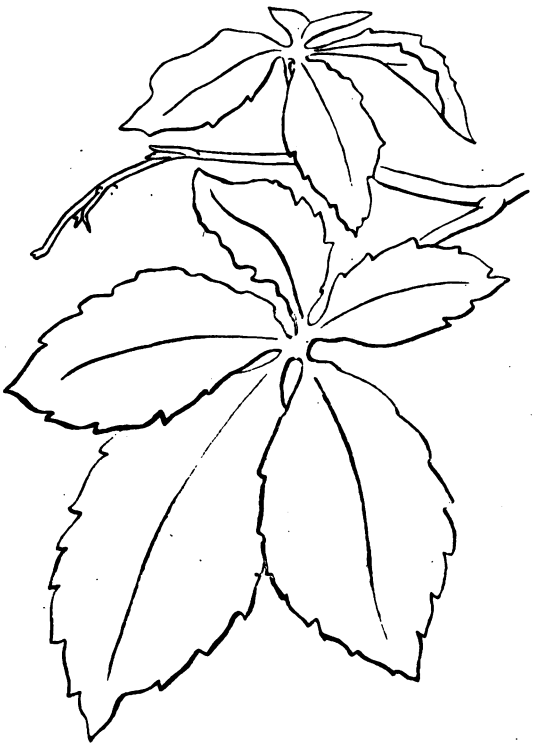
She walks in beauty, like the night
Of cloudless climes and starry skies,
And all that's best of dark and bright
Meets in her aspect and her eyes;
Thus mellowed to that tender light
Which heaven to gaudy day denies.

One shade the more, one ray the less,
Had half impaired the nameless grace
Which waves in every raven tress,
Or softly lightens o'er her face;
Where thoughts serenely sweet express
How pure, how dear, their dwelling place.

And on that cheek, and o'er that brow,
So soft, so calm, yet eloquent,
The smiles that win, the tints that glow,
But tell of days in goodness spent,—
A mind at peace with all below,
A heart whose love is innocent!

Freehand Drawing Copies.





Algebra.

BY W. H. HARVEY, B.A. (LONDON).

MULTIPLICATION.

Before entering upon this rule we will call the learner's attention to the following definitions, etc., some of which we have given in former chapters :—

The sign of Multiplication is ×, (read 'multiplied by.')

Those parts of an algebraical expression connected by + or − are called terms. Thus in the expression

$$5ab + 4abc - 6x \times 7c$$

there are three terms, viz. :—

$$5ab,\ 4abc,\ \text{and}\ 6x \times 7c.$$

An expression with two terms is called a *Binomial*, as $5ab + 4abc$.

If with three terms, it is called a ***Trinomial.***

With more than three, a ***Multinomial.***

We shall first of all direct our attention to the multiplication of simple terms.

We have already stated that an expression such as *abcd* means $a \times b \times c \times d$.

RULE I.—From this we see that the rule for multiplying *unlike letters* together is simply to write them down in succession without any sign between them.

Examples.

$$a \times b \times c \times d = abcd.$$
$$x \times y \times z = xyz.$$

It is usual to keep the alphabetical sequence of the letters as much as possible. This is, however, not absolutely necessary, for the product *abcd* is the same as *bcda* or *cdab*, just in the same way that 7×6 is the same as 6×7.

RULE II.—If the terms we are multiplying together contain different (or the same) powers of the same letter, as a^2 and a^3, or b^2 and b^2, we add together their INDICES.

Thus

$$a^2 \times a^3 = a^5$$
$$b^2x \times b^2x = b^4x^2$$

This rule follows of necessity from the system of notation adopted in Algebra, for

a^2 is simply an abbreviated form of $a \times a$
a^3 ,, ,, ,, $a \times a \times a$

and therefore

$$a^2 \times a^3 = a \times a \times a \times a \times a$$
$$= a^5$$

RULE III.—If the terms to be multiplied consist of several letters, some like and others unlike, we must proceed by Rule II. with the like terms and add their indices and by Rule I. with the unlike terms (simply writing them down in order).

Thus

$$ab^2c^3 \times ab^2c^2d = a^2b^4c^5d$$
$$x^2yz^2 \times y^2z^2 = x^2y^3z^3.$$

When the terms have *numerical coefficients* (*i.e.*, ordinary *arithmetical* numbers prefixed to them), these must be multiplied together, and the product obtained placed before the letters.

Thus

$$6ab^2c \times 7b^2c^2 = 42ab^3c^3$$
$$5xyz \times 6xyz = 30x^2y^2z^2.$$

Rule IV.—When the terms we are multiplying together are preceded by the same sign (both by + or both by −), we write + before our answer. If by unlike signs (one by +, the other by —), we write − before the result. Expressed more briefly, the rule is :—

Like signs produce +, *unlike produce* −.

Thus

$$+\ 6a \times +\ 7b = +\ 42ab$$
$$-\ 6a \times -\ 7b = +\ 42ab$$
$$+\ 6a \times -\ 7b = -\ 42ab$$

In working the following, remember that when no sign is expressed, + is understood.

EXERCISE IX.

(1) Multiply xy by ab, xyz by abc, m by n, abc by pqr.

(2) Multiply a by a, x^2 by x^5, a^2b^3 by a^3b^2, b^2d^3e by bde^2.

(3) Multiply xyz by yz, ab^2c by b^2cx, ax^2y^2 by bxy^2.

(4) Multiply $3ab$ by $7ab$, $15xyz$ by $6x^2z$, $30mn$ by $16m^2$.

(5) Multiply $-xy$ by $-xyz$, $4ab$ by $-10bc$, $5a^2b^2$ by $-6abc$.

(6) Find the continued product of $6ab^2c^2$, $-10bc^2$, and $-5a^2bx$.

(7) If a book has x pages, on each page a lines, and in each line $4b$ letters, how many letters are there in the book?

(8) How many pence are there in x pounds?

(The Answers to the Arithmetic and Algebra appear in the August number of the *Practical Teacher* and the *Governess*.)
Complete Answer Cards may also be had, price ½d. each

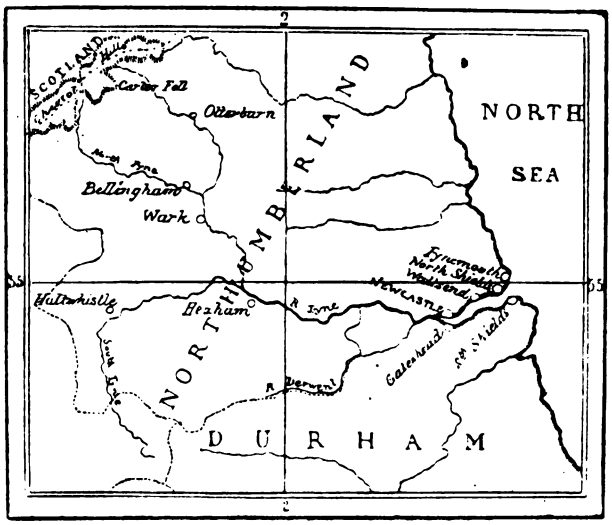
Up our Rivers.

VI.—THE TYNE.

THE river to which we shall next direct our attention is, although a small one and only about eighty miles long, celebrated for the flourishing towns on its lower course and the great importance of the industries carried on in them.

Steering straight in from the North Sea or German Ocean, we see the houses of Tynemouth lining the shore to the right. This strong wall which was built across the island, from sea to sea, by the Romans to keep out the marauding Picts and Scots. The collieries in the neighbourhood produce a remarkably good description of coal, and have made the name 'Wallsend' known everywhere.

A few miles more bring us to Newcastle and Gateshead. These places though on



place is much frequented for its sea-bathing, and forms simply a continuation of North Shields, a town celebrated for its ship-building and commerce generally, a little further up the river.

The estuary here forms one great port capable, it is said, of affording secure anchorage to 2000 merchant vessels.

On the opposite side of the river is South Shields. On continuing our course for a mile or two we come to Wallsend.

The name of this place is very appropriate, for it is built at the eastern end of the opposite sides of the river really form one large town and are connected by numerous bridges, one of which, the High Level Bridge, built by the great engineer, Robert Stephenson, is especially noticeable.

Newcastle used to be called in old Roman days 'Pons Ælii,' and fragments of the walls and towers with which it was surrounded may still be seen. A strong fortress built here by Robert, the ill-fated son of the Conqueror, is supposed to have originated the modern name.

All boys should remember Gateshead,

for Daniel Defoe is said to have resided in that town when writing his 'Adventures of Robinson Crusoe.'

Proceeding westward, we pass the mouth of the Derwent and come to the ancient town of Hexham. Originally the see of a bishop, it suffered considerably in the wars with Scotland, and was almost entirely destroyed by fire on one occasion during Edward I.'s reign.

It was here also that, on May 15, 1464, in the Wars of the Roses, the brave Queen Margaret was defeated by Lord Montacute, the brother of the Earl of Warwick. A little to the westward of Hexham the river divides into two branches distinguished by the names of North and South Tyne respectively.

The southern stream leads us near Haltwhistle, and rises among the bleak moorlands of the Pennine range, in the extreme east of Cumberland.

The first town of any importance we reach on the North Tyne is Wark, the name of which is probably due to some *works* (*i.e.* fortifications) thrown up here by Edward I.

A small stream called the Otter joins us a few miles farther north, and flows by Otterburn, celebrated for the battle which occurred there in 1388 between the Percys and the Douglases. There are several mounds and entrenchments on the battlefield, and a cross, called by a misnomer 'Percy's Cross,' has been erected on the spot where Douglas is supposed to have fallen.

Continuing our journey, we come to the prettily-situated town of Bellingham, which is the last place of any importance we shall pass.

The river now flows through a thinly-populated country covered with moor and heath, and has its source near the confines of Scotland, some twenty miles to the north, near Carter Fell, one of the Cheviots.

SUMMARY.

Source	Near Carter Fell, one of the Cheviot Hills.
Course	First south, then east.
Length	About 80 miles.
County through which it flows	Northumberland, and for the latter part of its course, between that county and Durham.
Tributaries on right bank	South Tyne and Derwent.
Tributary on left bank	Otter.
Towns on its banks	Bellingham, Wark, Haltwhistle (near South Tyne), Hexham, Newcastle and Gateshead, Wallsend, North and South Shields, Tynemouth.

The Pith of a Course of Domestic Economy Lessons.

BY MRS. WIGLEY,

Author of 'The Marshfield Maidens,' etc.

LESSON XXI.

WHATEVER is needed to reduce or change the food to such a condition that the little bloodvessels may be able to use it, is to be found *in* the body itself. Starch must be turned into sugar before it will dissolve and form part of the blood, and so we find a fluid in the mouth all ready to do the work.

Meat will not dissolve without a strong acid is poured upon it, so we find just what is wanted stored up in the stomach.

Fat will not mix unless something like soda is added to it, and so something like soda is already provided in order that the blood may have its proper supply of fat, as well as of other foods.

LESSON XXII.

ALL this is very wonderful. It is most important that our food shall be properly reduced and changed, in order that the body shall make use of it. Now

if we had to change it and reduce it before we put it into our mouths, there is great danger that we should not do it properly. We should find our acid bottle empty, or the soda shop shut up, and what could we do then? Even as it is, there are some people who will not take the trouble only *to cook* the food properly, and it would be a bad thing if *all* the work was left to careless hands.

But it is not so left. There is provided *within* the body very wonderful little organs which really manufacture and store up different kinds of fluids, so that the work may go on without any help from us. These wonderful little organs are called *glands*.

LESSON XXIII.

THERE are a great many different glands in the body. They are placed in the parts where the work has to be done. One set does one kind of work, and another set quite a different kind of work, but they never make a mistake or get into a muddle—the acid glands do not make soda, nor the soda glands acid. They do their work well. They have to make and store up the right fluid for the work they have to do; and in the *right* place, with the *right* fluid, and at the *right* time, they get the food ready for the body's use.

If we eat unwholesome food, such as unripe fruit or tough, half-cooked meat, or heavy, lumpy pudding, there are no glands provided to make such things fit for food. We ought to take care that we do not load these little organs with work they cannot do. If we do this, then *they* must get weak and diseased, and *we* shall suffer pain and illness, for our health depends upon theirs.

LESSON XXIV.

NOW let us remind ourselves of some of the things of which the body is made, for those things we must seek to obtain in the food we eat.

We will begin with the bones.

Bone is made almost entirely of lime and gelatine. You know that when men make mortar for building they mix up with the lime a quantity of hair. This spreads through the lime like threads, and holds it together so that it does not crumble away. And the gelatine does something like this in our bones—it forms very tiny fibres, which run up and down and in and out of the lime, and hold it well together. Without the gelatine, the lime would be brittle; without the lime, the gelatine would bend and twist about. Neither lime or gelatine would make good bones by themselves, but together they are all that we need for support.

Dictionary.

EXPLANATORY LIST OF THE MORE DIFFICULT WORDS OCCURRING IN THIS NUMBER.

Ardennes, one of the departments or counties of France, close on the borders of Belgium.
Assailing, attacking.
Banquet, a repast, feast, a grand entertainment.
Bards, poets, singers.
Cathedral, the principal church of a diocese, in which is the seat or throne of a bishop.
Chivalry, system of knighthood, heroic adventures.
Corsair, a pirate.
Critique, a criticism, review, opinion.
Gradually, by degrees.
Giaour, an infidel, a heretic.
Iniquities, sins, transgressions, wrongs.
Knell, the tolling of a bell at a death or funeral.
Lusty, vigorous.
Mustering, gathering together, assembling.
Primate, the highest dignitary of the Church.
Prophecies, foretellings.
Revelry, rejoicing, making merry.
Revenue, income, receipts, or rents from any source.
Ridiculous, deserving or exciting ridicule, absurd laughable.
Romantic, pertaining to romance, fictitious, extravagant.
Satire, ridicule, severity of remark.
Scathing, cutting, sharp, violent.
Squadron, company of soldiers.
Tenants, occupiers of land or houses.
Verdure, greenness, freshness of growth.
Violent, outrageous, acting with excessive force, vehement, passionate.
Voluptuous, given to excess of pleasure.
Weltering, rolling or wallowing.

WORDS, SOMEWHAT DIFFICULT IN SPELLING, NOT OCCURRING IN THE ABOVE LIST.

Answer.	Excessive.	Pierced.	Solemnly.
Century.	Extended.	Published.	Threaten.
Composed.	Foreign.	Recited.	Tough.
Counsels.	Guess.	Regained.	Variety.
Descriptive.	Hailed.	Residing.	Vision.

Arithmetic. BY W. SPENCER.

STANDARD III.

A. 1. Divide 7392 by 13.
2. ,, 13,971 by 23.
3. ,, 202,203 by 31.

B. 1. Divide seventy thousand and sixteen by 87.
2. Divide (601,823 − 48,719) by 111.
3. Divide (74,183 × 36) by 216.

C. 1. Divide four hundred and fifty-three thousand and twenty by 108.
2. Take £183 7s. 8½d. from £4000.
3. Add together £702 17s. 8½d., £969 15s. 6¾d., £2010, £19 19s. 10d., and £674 15s. 8¾d.

D. 1. From £897 take 897 crowns.
2. Divide 7,182,143 by 1694.
3. 1,013,008 ÷ 8156.

E. 1. 1236 cr. + 1462 h. cr. + 18,000 flor. + 14,338 farthings.
2. Bring 8,176,419 farthings to £ s. d.
3. How many twopences are there in 16,358 guineas?

F. 1. Subtract £936 14s. 8½d. from £6000, and bring the remainder to farthings.
2. Find the difference between 9378 cr. and 63,179 fl.
3. Divide 9,182,349 by the difference between 7196 and 3489.

ADVANCED EXAMINATION.

1. If a boy earns 1½d. an hour, how much would 200 boys earn in 24 days of 7½ hours each?

2. Half a sovereign was spent in pears at 1d. a pound, which were divided among 90 scholars,—how many pears would each get, 6 pears weighing a lb.?

3. From £701,723 14s. 8½d. take £60,914 18s. 9¾d., and bring the remainder to farthings.

STANDARD IV.

A. 1. Multiply £49 17s. 6¾d. by 16.
2. ,, £477 18s. 2½d. by 55.
3. Divide £9187 17s. 9¾d. by 15.

B. 1. Multiply £877 14s. 8¾d. by 96.
2. Multiply £683 18s. 2¼d. by 400.
3. How many inches are there in 9½ miles?

C. 1. Bring 6¾ million ounces to tons, cwts., etc.
2. How many square yards are there in 8 ac. 3 r. 28 per.?
3. If 2½ cwt. of hay cost 13s. 1½d., what would 15 tons cost?

D. 1. Multiply £67 18s. 9½d. by 365.
2. Divide £273,671 12s. 10d. by 638.
3. What would 855 oranges cost at 8d. a score?

E. 1. How many seconds are there from Friday at 6.27 a.m. to the following Thursday at 4.38 p.m.?
2. Bring 7,184,295 sec. to days, etc.
3. Divide £7854 16s. 8½d. by 9183.

F. 1. Bring 7,164,831 dr. to cwts., etc.
2. If copy-books are 27s. a *gross*, how many *dozen* could be bought for £16 17s. 6d.?
3. 27 lb. 9 oz. 17 dwt. 19 gr. × 605.

ADVANCED EXAMINATION.

1. A grocer gave £600 for a quantity of tea, and by retailing it at 2½d. an oz. he gained £150 by it. How much tea did he buy for the £600?

2. If 6 rabbits are worth 8 pigeons, and 20 pigeons be worth 25s., what would 300 rabbits be worth?

3. How many girls' dresses, each requiring 6 yd. 2 qr. 2 nl., can be be made out of 64 pieces of merino, each piece containing 36 yd. 3 qr. 3 nl.?

STANDARD V.

A. 1. 6083 lemons at ½d. each.
2. 8479 ,, 1½d. ,,
3. 9085 ,, 2½d. ,,

B. 1. 8715 knives at 3½d. each.
2. 7 937 ,, 10½d. ,,
3. 9083 ,, 2s. 8½d. ,,

C. 1. 8277 articles at 17s. 7½d. each.
2. 9185 ,, £3 13s. 10d. ,,
3. What would 16 ton 16 cwt. 3 qr. 16 lbs. cost at £4 17s. 8d. a ton?

D. 1. If 17 books cost 37s. 2½d., what would 120 books cost?
2. 81,795½ at £11 13s. 3d. each.
3. 18 ac. 3 r. 26 per. at £46 12s. 8d. an acre.

E. 1. A bill:—3½ yds. at 5s. 9d., 6¼ at 6s. 9d., 2⅜ at 8s. 7d., 14½ at 5s. 5d., and 18¼ at 2s. 3d.
2. 120 yds. 3 qr. 3 nl. at 5s. 6d. a yard.
3. What would 2¾ million bricks cost at £1 13s. 9d. a thousand?

F. 1. What would 780 oranges cost if 160 cost 8s. 6d.?
2. A bill:—3½ ton at 7s. 6d. a cwt., 3½ cwt. at 7s. 6d. a ton, 56 lb. at 36s. 8d. a ton, 4½ lb. of tea at 2½d. an oz., and 126 lb. at 10s. 6d. a cwt.
3. 18 ac. 3 r. 27 per. at 2s. 9d. a *sq. yard*.

ADVANCED EXAMINATION.

1. Make out this bill in proper form, and then receipt it:—50 bales of Sydney wool, each 240 lb., at 1s. 8½d. a lb.; 84 bales of Queensland wool, each 230 lb., at 1s. 9d. a lb.; 70 bales of German wool, each 200 lb., at 1s. 7½d. a lb.; 90 bales of Spanish wool, each 180 lb., at 1s. 10½d. a lb.
2. Divide £168 among 20 men, 40 women, and 60 boys,—so that a man gets 6s. more than a woman, and a woman 4s. more than a boy. What will each boy get?
3. If 46 ac. 3 r. 20 per. of land cost £2,170 15s., what would 150 ac. 3 r. cost?

STANDARD VI.

A. 1. $\frac{3}{4}+\frac{7}{8}+\frac{5}{8}+1\frac{1}{2}$.
2. From $7\frac{3}{8}$ take $\frac{1}{8}$ of $5\frac{1}{2}$.
3. $(8\frac{3}{4}-1\frac{1}{8})\div 7\frac{3}{8}$.

B. 1. $\cdot 035+2\cdot 845+\cdot 00725$.
2. $(7\cdot 835-3\cdot 82)\div 250$.
3. Bring 6s. $8\frac{1}{2}$d. to the dec. of £5.

C. 1. If 8 horses plough 20 acres in 6 days, in how many days would 18 horses plough 36 acres?
2. What would 200 lbs. of ham cost, if 10 lbs. of bacon cost 5s. 6d., the value of ham to bacon being as 5 to 4?
3. If $3\frac{1}{4}$ ton of coal cost $38\frac{1}{2}$s., what would $8\frac{1}{2}$ cwt. cost?

D. 1. $8\frac{3}{8}+7\frac{3}{8}+3\frac{6}{12}+4\frac{4}{6}$.
2. If $\frac{3}{5}$ of a field be worth £277 10s., what would $\cdot 175$ of the field be worth?
3. $(7\frac{3}{8}+4\frac{3}{8})\div(9\frac{1}{2}-6\frac{3}{8})$.

E. 1. £9·15+63·485 cr.+·095 g.−81·45 fl.
2. What would 8·15 cwt. of coffee cost at ·85d. an oz.?
3. Bring $9\frac{3}{4}$d. to the dec. of £8000.

F. 1. $\frac{1}{10}+\frac{1}{11}+\frac{1}{12}+\frac{1}{13}$.
2. 13·15 oz.−·075 lb., bring the remainder to v. f. of $1\frac{3}{4}$ lbs.
3. A block of granite 8 feet by 5 by 3 cost £5, find the cost of a block 6 feet by 3 by 2.

ADVANCED EXAMINATION.

1. A piece of work which A and B could do in 12 days was done by A, B, and C in $9\frac{1}{2}$ days, in what time could C have done it alone?
2. A road 3 miles long was expected to have been made by 50 men in 50 days of 10 hours each, but only $1\frac{3}{4}$ miles being done in 30 days, how many hours a day, with 2 additional men must they now work to complete it in time?
3. $\dfrac{6\frac{3}{4}-4\frac{5}{8}}{8\frac{3}{8}\div 12\frac{1}{8}}\div\dfrac{9\frac{1}{2}\times 3\frac{3}{5}}{7\frac{1}{8}+3\frac{3}{4}}$.

STANDARD VII.

A. 1. Find simple interest of £2840 for 2 years at 5 per cent.
2. Find simple int. of £847 12s. 6d. for 3 years at 4 per cent.
3. At what rate per cent. would £650 amount to £737 10s. in $3\frac{1}{2}$ years?

B. 1. Find the square root of 106,929.
2. How much interest would £62 15s. 9d. make in $2\frac{1}{4}$ years at 3 per cent.?
3. In how many years would £387 10s. amount to £500 at 6 per cent. simple interest?

C. 1. What is the commission on £8775 at £1 13s. 9d. per cent.?
2. Find the compound interest of £862 10s. for 3 years at 5 per cent.
3. What would £767 10s. amount to in 3 yrs. 4 mths. at 4 per cent. simple interest?

D. 1. What sum of money (principal) put out at simple interest for $2\frac{1}{2}$ years at 5 per cent. would amount to £425?
2. Find the cube root of 273,359,449.
3. Add 55 per cent. to £17 12s. 6d.

E. 1. A grocer bought soap at 25s. 3d. a cwt., and sold it at $3\frac{1}{2}$d. a lb. Find his gain per cent.
2. How much money must be invested in the 3 per cents. at $101\frac{1}{2}$ to produce £200 a year?
3. Find the discount on £250 paid 8 months before due at $4\frac{1}{2}$ per cent. per annum.

F. 1. In how many days at 5 per cent. would £685 make 17s. 9d. interest?
2. Find the brokerage on £4785 10s. at 4s. 3d. per cent.
3. If 18 per cent. be gained by selling ribbon at 9d. a yard, what would be the gain or loss per cent. by selling it at $6\frac{1}{2}$d. a yard?

ADVANCED EXAMINATION.

1. A school consists of four classes, 20 per cent. of the scholars being in the first class, 24 per cent in the second, 26 per cent. in the third, and the fourth class contains 45 scholars. Find the number of scholars in the school.
2. A person transfers £4500 stock from the 3 per cents. at $92\frac{1}{2}$, to Bank of England stock at 260 paying 10 per cent. What is the alteration in his annual income?
3. A square field contains 6 ac. 2 rd. 20 per., find its side in yards.

LIGHTLY GO!

T. CRAMPTON.

In moderate time.

1st TREBLE.
2nd TREBLE.
BASS.

1. Light - ly go, to and fro, O - ver the school-room floor; Step with care—
2. Keep each game free from blame, E- - er be good and kind; Play with glee,
3. From your play, come a - way Prompt-ly when teach - ers call,— Do not wait,

KEY E. *In moderate time.*

1st TREBLE.	s	.d'	:m	m	.s	:d	r	.m	,f	:m	.r	m	:	s	.d'	:m
2nd TREBLE.	m	.m	:d	d	.d	:d	d	.d	,d	:d	t_1	d	:	m	.m	:d
BASS.	d	.d	:d	d	.m	:m	f	.m	,r	:s	s_1	d	:	d	.d	:d

path - way clear,— Out of the school-room door. Let a smile, free from guile,
joy - ous, free— Mirth is a friend you'll find: "Kind to all, great and small,"
nor be late, Haste to your stud - ies all. Fix your look on your book,

B. t.

	m	.s	:d	r	.m	,f	:m	.r	d	:	rs_1	.d	:d	l_1	.r	:r
	d	.d	:d	d	.d	,d	:d	$.t_1$	d	:	t_1m$_1$	.m_1	:m_1	f_1	.f_1	:f_1
	d	.m	:m	f	.m	,r	:s	$.s_1$	d	:	s$_1$d$_1$	.d_1	:d_1	f_1	.f_1	:f_1

Light each youth - ful face; Let no word e'er be heard When you take your place.
Let your mot - to be; Do not fret; make no threat; From all mis - chief flee.
While your stud - ies last; On your guard, stud - y hard Till the hour is past.

	t_1	.d	:r	$.t_1$	d	:	r	.m	:f	m	.s	:d	r	.f	:m	.r	d	:
	r_1	.m_1	:f_1	$.r_1$	m_1	:	t_1	.d	:r	d	.d	:d	l_1	.l_1	:s_1	$.f_1$	m_1	:
	s_1	.s_1	:s_1	$.s_1$	d_1	:	s_1	.s_1	:s_1	d_1	.m_1	:m_1	f_1	.r_1	:s_1	$.s_1$	d_1	:

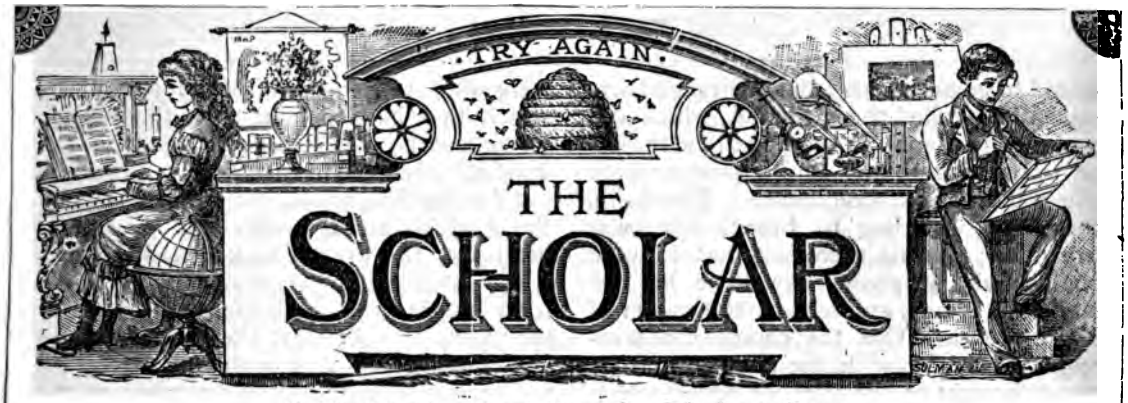
CHORUS.

In a song, full and strong, Let the rest - time glide a - long.

f. E. CHORUS.

	ds	.d'	:m	f	.l	:r	m	.f	:s	.l	m	.r	:d
	l_1m	.m	:d	d	.d	:t_1	d	.d	:d	.d	d	.t_1	:d
	f_1d	.d	:d	l_1	.f_1	:s_1	d	.l_1	:m_1	.f_1	s_1	.s_1	:d

LONDON: PUBLISHED BY JOSEPH HUGHES, PILGRIM STREET, LUDGATE HILL



A Monthly Educational Paper for School and Home.
Conducted by JOSEPH HUGHES.

No. 7. Vol. I. SEPTEMBER, 1882. [Price ½d. Per post, 13 copies for 7½d.

CONTENTS.

1. Stories from English History 73
2. Gems from the Poets 75
3. Algebra 77
4. Up our Rivers.—VII. The Tweed. With Map 78
5. Dictionary 79
6. Domestic Economy 80
7. Arithmetic for Standards III., IV., V., VI., VII. .. 81
8. Freehand Drawing Copies 83
9. Music 84

Stories from English History. 7.—The Fight at Crecy (A.D. 1346).

BY THE REV. SIR G. W. COX, BART, M.A.

EDWARD III. chose to begin with the French king a war which lasted, with some breaks, for about a hundred years. He said that the French crown was his own by right, as he was the son of the daughter of a French king whose son, if he had one,

[ALL RIGHTS RESERVED.]

would have been king; but in France there was a law, called the Salic law, which did not allow a woman to succeed to the throne, or to hand on to her sons a power which she could not exercise herself. The claim, therefore, according to French law, was worthless; but the mere fact that Edward could make it shows how little he had learnt the lesson, enforced by the career of his own father, that the choice of a sovereign lay really with the people; and he never thought of the grievous wrong which he was doing to all Frenchmen by trying to force himself upon them as their king.

So, as if he were going to a great tournament, in which gallant knights were to show their bravery and skill by brilliant feats of arms, Edward landed his army on French ground; but his army was made up, not of Normans, but of Englishmen, and he had come as an English king to secure an inheritance which belonged, as he said, to the wearer of the English crown. The English now looked on themselves as a conquering, not as a conquered people; but it was a miserable thing that they should be ready to lend themselves to unjust schemes, which must bring misery to a people who had done them no wrong.

For, in truth, Edward carried wretchedness wherever he went. He plundered the towns and wasted the country as he marched along the valley of the Seine. He hoped that he might be able at once to fight a battle which should crush the power of the French king, and perhaps leave him a prisoner in his hands. But the French king Philip thought that the farther Edward marched the more difficult his way would be; and, in truth, Edward found himself in almost desperate straits, with the river Somme before him and the French army, numbering nearly ten to one of his own men, behind him. He could not cross by the bridges, for these were all strongly guarded; but a peasant told him of a ford which they could cross at low water. When the English reached it the tide had not gone down enough; but at length they were able to plunge into the stream, in which they had to fight with the French warriors, who had been stationed on the opposite bank. The struggle was decided, not by the knights on their horses, but by the English archers, who shot over their heads into the French ranks; and this was a sign that real power was passing away from knights and nobles into the hands of the people. At last the passage was forced, and Edward was able to march on to Crecy, where he posted his army on the sloping ground near the little town. The French king had hurried to the ford after him; but the tide had come in again when he reached it, and he was obliged to go round by Abbeville. This gave Edward time to rest his men, and to prepare for the battle which he was determined to fight as soon as he could. 'We will go no farther,' he said; 'I am now in the country which belongs to me by my mother's right, and it is my duty to defend it against my enemies.'

There that evening he gave a supper to the earls and barons of his army; and the next morning he arranged his troops in three divisions, one of which was under the command of the Prince of Wales, a lad now fourteen years old, assisted by the Earls of Warwick and Northampton. Mounted on a small white horse, he then rode along the ranks, speaking, the chronicler Froissart tells us, so cheerfully that all who had been dispirited were comforted by his countenance and his words. He himself looked forward with confidence to the fight. He knew that he was strongly posted, and he knew probably that his own men, though much fewer in number, were better trained and drilled than those of the French king. As it so turned out, his safety lay in the multitude of his enemies. The French army was, in truth, utterly unwieldy, and it came up tired out with long marching. To weary and hungry men the day itself seemed to forebode disaster. The sun happened to be eclipsed; the air was filled with frightened birds, which flew

screaming over their heads; and then the rain fell in torrents. At five in the afternoon the sun broke out again brilliantly; but it shone full in the faces of the French, dazzling and almost blinding them, while the English had it at their backs. The battle began. The hired archers in the French army found that the rain had soaked their bow-strings, and made them almost useless. The English had kept their bows in canvas cases, and had them all in good trim; and the aim of the English bowmen was so sure, and their shooting so rapid, that the hired archers opposed to them threw down their weapons and fled. Then followed the struggle of knights and horsemen, fighting hand to hand; and so hardly pressed were the English with the young Prince of Wales that a message was sent to intreat King Edward to send them help. 'Is my son dead,' he asked, 'or is he unhorsed, or so wounded that he cannot stand?' 'No,' answered the messenger. 'Then,' replied the king, 'let the boy win his spurs! I am resolved, if it please God, that the honour and glory of this day shall belong to my son, and to those who have the care of him.'

While the knights fought, the English archers were sending the fatal showers of their arrows on the French hosts; and there is little more to say of the battle than that it soon became mere carnage. 'Lead me into the fight,' said the blind old King of Bohemia, who was with the French king, 'that I too may have a stroke at the English.' Two knights tied the bridle of his horse with their own bridles; and riding forward, all three were immediately cut down. The sun set, the summer night grew dark, and still the work of slaughter went on, till under the cover of the darkness the remnants of the French host left the ground. On meeting his son the king kissed him, and prayed that he might have grace to persevere as he had begun. The boy had fought in black armour, and hence he was known afterwards always as the Black Prince.

The field was loaded with dead, and Edward was obliged to give a truce of three days for the clearing of the ground. 'What do you think of a battle?' he asked his son, as they walked together over the field. 'Is it a pleasant game?' We should be tempted to say that he did look on slaughter as good sport, if we may judge from the massacre of Limoges.

Gems from the Poets.

PERCY BYSSHE SHELLEY.

1792—1822.

PERCY BYSSHE SHELLEY was born at Field Place, near Horsham, in Sussex, in August, 1792. He was the son of Sir Timothy Shelley, and was educated at Eton, where he was chiefly known as being a shy, diffident boy of studious and quiet habits. In 1810 he went to Oxford, from which university he was expelled in his second year of residence because of his writing and printing an anonymous 'Defence of Atheism.' On his expulsion being made known to Sir Timothy, the latter refused to see his son, and Shelley accordingly took up his residence in London, where he was supported by his sisters, who, unknown to their father, contrived to

supply him with money. In 1814, after a separation from his first wife, a mere girl, whom he had hastily married at Gretna, and who was in no way suited to him, the poet went abroad, and visited France, Switzerland, and Germany. On his return Sir Timothy became reconciled to him in some measure, and agreed to allow him £800 a year. He took up his residence in Devonshire, and there wrote 'Alastor,' which was published in 1815. Three years afterwards he left England, never to return. He went to Italy, and there made the acquaintance of Lord Byron, in whose company he visited Milan, Florence, Rome, and Venice. In 1822, while residing on the shores of the Gulf of Spezzia, he was drowned. He had gone out one morning with a friend for a sail, when the boat was capsized in a sudden squall. His dead body, thrown up some days afterwards, was, in accordance with Tuscan law, cremated, and the ashes were placed in an urn in the foreign cemetery at Rome. Shelley was only thirty at the time of his death, and yet he had produced works which will keep his name in remembrance for a long time. His greatest poems are 'Prometheus,' 'The Cenci,' 'Adonais,' and those wonderful lyrics of which the 'Ode to the West Wind' is a good example.

J. S. FLETCHER.

ODE TO THE WEST WIND.

I.

O, wild West Wind, thou breath of Autumn's being,
Thou, from whose unseen presence the leaves dead
Are driven, like ghosts from an enchanter fleeing,
Yellow, and black, and pale, and hectic red,
Pestilence-stricken multitudes: O, thou,
Who chariotest to their dark wintry bed
The winged seeds, where they lie cold and low,
Each like a corpse within its grave, until
Thine azure sister of the spring shall blow
Her clarion o'er the dreaming earth, and fill
(Driving sweet buds like flocks to feed in air)
With living hues and odours plain and hill:
Wild spirit, which art moving everywhere;
Destroyer and preserver: hear, O, hear!

II.

Thou on whose stream, 'mid the steep sky's commotion,
Loose clouds like earth's decaying leaves are shed,
Shook from the tangled boughs of heaven and ocean
Angels of rain and lightning: there are spread
On the blue surface of thine airy surge,
Like the bright hair uplifted from the head
Of some fierce Maenad, even from the dim verge
Of the horizon to the zenith's height
The locks of the approaching storm. Thou dirge
Of the dying year, to which this closing night
Will be the dome of a vast sepulchre,
Vaulted with all thy congregated might
Of vapours, from whose solid atmosphere
Black rain, and fire, and hail will burst: O, hear!

III.

Thou who didst waken from his summer dreams
The blue Mediterranean, where he lay,
Lulled by the coil of his crystalline streams,
Beside a pumice isle in Baiae's bay,
And saw in sleep old palaces and towers
Quivering within the wave's intenser day,
All overgrown with azure moss and flowers
So sweet, the sense faints picturing them! Thou
For whose path the Atlantic's level powers
Cleave themselves into chasms, while far below
The sea-blooms and the oozy woods, which wear
The sapless foliage of the ocean, know
Thy voice, and suddenly grow grey with fear,
And tremble and despoil themselves: O, hear!

IV.

If I were a dead leaf thou mightest bear;
If I were a swift cloud to fly with thee;
A wave to pant beneath thy power, and share
The impulse of thy strength, only less free
Than thou, O, uncontrollable! If even
I were as in my boyhood, and could be
The comrade of thy wanderings over heaven,
As then, when to outstrip thy skiey speed
Scarce seemed a vision; I would ne'er have striven
As thus with thee in prayer in my sore need.
Oh! lift me as a wave, a leaf, a cloud!
I fall upon the thorns of life! I bleed!
A heavy weight of hours has chained and bowed
One too like thee: tameless and swift and proud.

V.

Make me thy lyre, even as the forest is:
What if my leaves are falling like its own!
The tumult of thy mighty harmonies
Will take from both a deep, autumnal tone,
Sweet thought in sadness. Be thou, spirit fierce,
My spirit! Be thou me, impetuous one!
Drive my dead thoughts over the universe
Like withered leaves to quicken a new birth!
And, by the incantation of this verse,
Scatter, as from an unextinguished hearth,
Ashes and sparks, my words among mankind!
Be through my lips to unawakened earth
The trumpet of a prophecy! O, wind,
If Winter comes, can Spring be far behind?

Algebra.

BY W. H. HARVEY, B.A. (LONDON).

We now proceed to the multiplication of expressions consisting of more than one term.

First, to multiply such an expression by a simple term.

Rule V.—Write the simple term under the first term of the multiplicand (see following example), and multiply each term in order according to the rules previously given.

Thus, to multiply $a^2 + bc$ by c^2 we write the expressions down and proceed as follows:—

Ex. 1.
$$\begin{array}{l} a^2 + bc \\ c^2 \\ \hline a^2c^2 + bc^3 \end{array}$$

Ex. 2.
$$\begin{array}{l} a^2 + 2bc + c^2 \\ ab \\ \hline a^3b + 2ab^2c + abc^2 \end{array}$$

Secondly, to multiply an expression consisting of more than one term by a similar expression.

Rule VI.—Write the multiplier under the multiplicand, term under term. Multiply each term of the multiplicand (prefixing proper signs) by the first term of the multiplier, then do the same by the second term of the multiplier, and so on until all the terms of the multiplier have been gone through. Then collect these partial products to form the complete product. (See following examples.)

Ex. 3. Multiply $a^2 + ab + b^2$ by $a + b$

$$\begin{array}{ll} & a^2 + ab + b^2 \\ & a + b \\ \hline \text{(Multiplying first by } a) & a^3 + a^2b + ab^2 \\ \text{(Multiplying then by } +b) & \quad + a^2b + ab^2 + b^3 \\ \text{by Add.} & a^3 + 2a^2b + 2ab^2 + b^3. \quad \text{Ans.} \end{array}$$

Ex. 4. Multiply $2a + 2b + 4c$ by $2a - 2b - 2c$

$$\begin{array}{ll} & 2a - 2b - 2c \\ \hline \text{Multiply by } 2a & 4a^2 + 4ab + 8ac \\ \text{Then by } -2b & \quad - 4ab \quad - 4b^2 - 8bc \\ \text{Then by } -2c & \quad - 4ac \quad - 4bc - 8c^2 \\ \text{By adding} & 4a^2 \quad + 4ac - 4b^2 - 12bc - 8c^2 \end{array}$$

Ex. 5. Find the value of $(2x + 3y)^2$.

This means that $2x + 3y$ is to be multiplied by itself.

$$\begin{array}{l} 2x + 3y \\ 2x + 3y \\ \hline 4x^2 + 6xy \\ \quad + 6xy + 9y^2 \\ \hline 4x^2 + 12xy + 9y^2 \quad \text{Ans.} \end{array}$$

EXERCISE X.

(1) Multiply $a^2 + b^2$ by $a + b$.
(2) Multiply $a^2 + b^2 + c^2$ by $a + b$.
(3) Multiply $3x + 2y$ by $2x + 3y$.
(4) Find the product of $x^2 - 2x + 3$ and $x - 3$.
(5) Find the product of $a + 2b + 3c$ and $a - 2b$.
(6) Find the product of $x^2 - 2ax + a^2$ and $x + a$.
(7) Multiply $w^2 - 2ax + a^2$ by $w^2 + 2ax + a^2$.
(8) Multiply $4ab + 4b^2$ by $2ab - 3b^2$.
(9) Find the value of $(a + b)^2$.
(10) Find the value of $(2a + 2b + 2c)^2$.
(11) Find the value of $(x + y + z)^2$.
(12) Find the value of $(a + b)^3$.

Remember, in working the following, that when no sign is expressed between a quantity and a bracket or between two brackets, the sign of multiplication is to be understood.

(13) Simplify $(a + b - c)(a - b + c)$.
(14) Simplify $6(3a + 2b)(2a - 3b)$.
(15) Simplify $(a^2b + 2abc^2)(ab^2 - 6a^2b)$
(16) Multiply the sum of $2xy + 2yz$ and $3xy - 6yz$ by $7x^2y^2$.

The following particular results in Multiplication should be carefully remembered, since their application will save a great deal of labour,

(1) $(x + y)^2 = x^2 + 2xy + y^2$.
(2) $(x - y)^2 = x^2 - 2xy + y^2$.
(3) $(x + y)(x - y) = x^2 - y^2$.

The following examples will show the method of applying these results.

Ex. 1. Suppose we wish to find the value of $(a + b)^2$ We know from result 1 that

$$(x + y)^2 = x^2 + 2xy + y^2$$

and if we write a instead of x, and b instead of y, we get

$$(a + b)^2 = a^2 + 2ab + b^2.$$

Ex. 2. Suppose we wish to find the value of $(a - 3b)^2$ From result 2 we see that

$$(x - y)^2 = x^2 - 2xy + y^2$$

in which, by writing a for x, and $3b$ for y, we get

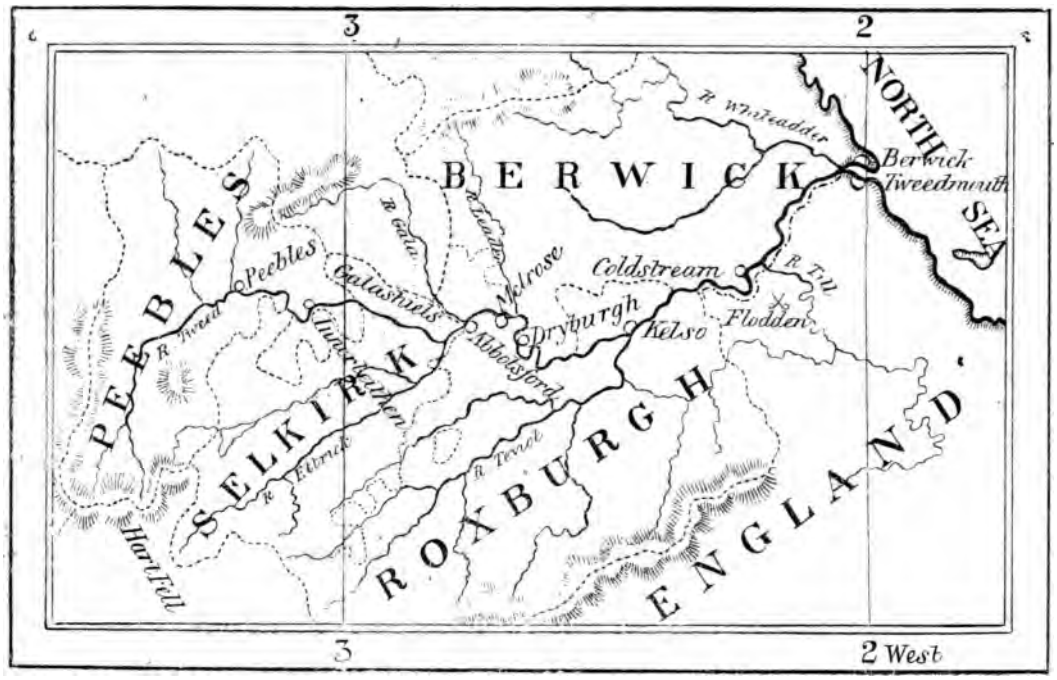
$$(a - 3b)^2 = a^2 - 2 \times a \times 3b + 9b^2 = a^2 - 6ab + 9b^2.$$

EXERCISE XI.

Write down the values of

(1) $(a - b)^2$.
(2) $(m + n)^2$.
(3) $(y - z)^2$.
(4) $(m + n)(m - n)$.
(5) $(a + 2)^2$.
(6) $(3a + 2b)^2$.
(7) $(a + b)(a - b)$.
(8) $(x - 1)(x + 1)$.

(The Answers to the Arithmetic and Algebra appear in the September number of the *Practical Teacher* and the *Correspondence*.)
Complete Answer Cards may also be had, price 4d. each.



Up our Rivers.

VII.—THE TWEED.

THE Tweed—up which we purpose taking our imaginary trip this month—forms, during the latter part of its course, the boundary between England and Scotland. It drains the south-eastern counties of the latter country, and falls, after a course of about 100 miles, into the German Ocean.

The first town we see on entering the river is Berwick-on-Tweed, which is an old picturesque town with a pier and lighthouse on the northern bank, still surrounded by fortified walls, and possessing the peculiarity, like Newcastle and some other towns in the kingdom, of forming a county by itself. In the early history of our country its name often occurs. King John stormed the town in 1216, and in the hall of the castle in 1292 Edward I. pronounced judgment in favour of Baliol as King of Scotland. After being retaken by Bruce in 1308, it was surrendered to Edward IV. for good in 1482. On the opposite side of the river we see the more modern town of Tweedmouth.

Leaving both towns behind us, we proceed up stream, pass the mouth of the Adder on our right, and soon reach that of the Till on the left. The latter stream flows near the battle-field of Flodden, so fatal to the Scotch and their King, James IV., in 1513.

We then arrive at Coldstream, a town which gives its name to the Coldstream Guards, the first regiment bearing that title being raised there by General Monk in 1659. Here also was one of the chief fords or passages across the river, by which, in olden time, incursions were made from the one country into the other.

Still proceeding westward, we enter the county Roxburgh, and reach Kelso, a town at the mouth of the river Teviot,

which, like Berwick, suffered considerably in the early wars between the two countries. In the outskirts are the ruins of a fine old abbey, founded in 1128 by King David I. A few more miles bring us, through some of the prettiest scenery on the river, to Dryburgh Abbey, in which lie the remains of Sir Walter Scott, whose pen has immortalized the whole district through which we are passing.

A small stream called the Leader now flows in on our right, and shortly afterwards we see on the opposite bank the small village of Melrose, with the ruins of another magnificent abbey, commenced in 1326 by Robert Bruce. The river Gala, on which is situated the town of Galashiels, famous for its manufactures of woollen goods, here joins us on the right, and on the opposite bank stands Abbotsford, the residence of Sir Walter Scott.

We then pass the mouth of the Ettrick, near the head waters of which was the birthplace of the poet, James Hogg, the Ettrick shepherd; and after leaving Innerleithen, a village celebrated for its mineral springs, and mentioned in Scott's works under the name of St. Ronan's Well, we come to the small town of Peebles. Above this the Tweed trends southward, and, after tracing its course through a picturesque valley, called Tweeddale, shut in by hills on either side, we find the source of the river in Hart Fell, a mountain 2,635 feet high in the extreme south of the county of Peebles.

SUMMARY.

Source	In Hart Fell, in the South of Peebles.	**Tributaries on right bank ... ...**	Ettrick, Teviot, and Till.
Course	First north, then east.	**Tributaries on left bank**	Gala, Leader and Adder.
Length	About 100 miles.	**Towns and places of interest on its banks**	Peebles, Innerleithen, Abbotsford, Melrose, Dryburgh, Kelso, Coldstream, Berwick, and Tweedmouth.
Counties through which it flows.	Peebles, Selkirk, Roxburgh, and between Berwick and Northumberland.		

Dictionary.

EXPLANATORY LIST OF THE MORE DIFFICULT WORDS OCCURRING IN THIS NUMBER.

Anonymous, without a name.
Atheism, disbelief in the existence of God.
Azure, a faint blue, sky-coloured.
Carnage, slaughter, bloodshed.
Clarion, a shrill trumpet.
Cremated, burnt.
Diffident, distrustful of one's self, modest, bashful.
Drilled, exercised in the use of arms, and in military movements.
Eclipsed, light intercepted by the passing of some other heavenly body.
Enchanter, a charmer.
Forebode, predict, foretell.
Hectic, a pale red.
Immortalized, never to be forgotten.
Incantation, an act of enchantment.
Incursions, hostile inroads.
Massacre, slaughter.
Mineral, a metallic substance, that which is dug out of a mine.
Outskirts, borders, suburbs.
Plundered, robbed of anything by force.
Plunge, to fall suddenly into water.
Prophecy, a declaration of something to come, a foretelling.
Remnants, remains.
Screaming, a shrill crying.
Tournament, a sham fight in which combatants, generally mounted on horses, fought to show their skill in arms.
Trim, condition, order.
Unwieldy, unmanageable.

WORDS, SOMEWHAT DIFFICULT IN SPELLING, NOT OCCURRING IN THE ABOVE LIST.

Accordingly.	Feats.	Peasant.	**Schemes.**
Dazzling.	Guarded.	Pestilence.	**Sufficient.**
Desperate.	Imaginary.	Picturesque.	**Tumult.**
Enforced.	Inheritance.	Remembrance.	**Uncontrollable.**

The Pith of a Course of Domestic Economy Lessons.

BY MRS. WIGLEY,

Author of 'The Marshfield Maidens,' etc.

LESSON XXV.

TO keep the bones strong and to mend every place that wears away, we must eat bone-making food, or as we call it, mineral food. Now we get minerals in several kinds of food.

We get it in water. Salt, and lime, and iron, are found in our drinking water, and we eat it with other food in the shape of common salt, and it is found in vegetables in the shape of potash. The quantity of mineral food that is necessary is not very large, so that if our drinking water is pure, and if we are careful to eat sufficient vegetables, we are almost sure to get enough. If people are unable to get fresh vegetables their blood becomes impure and they have all sorts of skin diseases. When our sailors go long voyages they often suffer because they cannot get enough mineral food by means of vegetables.

Here is a list of our principal mineral foods and the food in which we are likely to find them :—

Common Salt, found in all animal food, and we also add it to many foods.

Potash, found in seeds that are food, such as peas and beans, and also in fruits and vegetables.

Lime, found in water, and in seeds, and fruits.

Iron, found in small quantities in nearly all solid foods, also in milk and water.

In every 1,000 lbs. of the following foods there is so many pounds of mineral food only :—

	Lbs.		Lbs.
Apples	4	Oatmeal	21
Wheaten flour	7	Peas	30
Turnips	8	Cocoa nibs	36
Potatoes	10	Wheat bran	60
Barley	11	Cow's milk	7
Cabbage	12	Lean mutton	17
Bread	12	Eggs (without shells)	18
Watercress	13	Gloucester cheese	50
Maize	20		

LESSON XXVI.

NOW we must look at our flesh, and try and understand where we are to get the proper food to nourish it.

Flesh is made of albumen or fibrine and gelatine and water. You know that one large class of foods are called 'Nitrogenous' or 'Flesh-forming foods. If you look again at Lesson X. in these little books, you will find these words—'The principal nitrogenous foods are called Fibrine, Gluten, Albumen, Casein, Legumin, and Gelatine.'

Now these are the foods that make flesh, and they are called by different names because they are found in different places, though some of them are very much alike. For instance, casein is found in cheese, and legumin is found in peas and beans. This last is often called 'vegetable casein,' and is really more easily digested than the first.

Albumen is found almost pure in the white of an egg, in the juice of most vegetables, in the blood of animals, and in most seeds.

Fibrine is also found in vegetables and in all flesh foods ; also in wheat grain, where it is called gluten.

Gelatine is found in flesh, fibre, and tissue.

Casein in the curd of milk, of which we make cheese.

Legumin in peas and beans.

LESSON XXVII.

OUR warmth-giving foods are of three kinds and have three different names, as you have learned.

1. *The Farinaceous or floury starchy foods.* All foods which contain starch or flour come under this head—flour and meal, rice, corn-flour, sago, and arrowroot, as well as many others.
2. *The Oleaginous foods.* These are those that contain fat in any form. Butter, milk, the fat of meat, nuts in which there is much oil, and many others.
3. *The Saccharine or sugary foods.* Sugar is found in almost everything. Some vegetables contain large quantities of it, so much, indeed, that we make sugar from them, as in the case of the beetroot. All fruits, too, contain sugar, and we have besides the sugar-cane.

Here is something which a very learned man tells us about sugar :—

'Grape sugar is found in all vegetables. It can be made from starch, as well as from cane sugar, and by the action of strong acids we can procure it from paper, old rags, and some woods.'

A gentleman once said, that 'if all other sources failed, enough sugar could be procured for the whole world *from sawdust only*.'

Arithmetic. BY W. SPENCER.

STANDARD III.

A. 1. $(763,849 \times 73) \div 15$.
2. $(796,385 \times 40) \div 72$.
3. $(9,220,140 \div 6) \div 708$.

B. 1. Divide six hundred and four thousand and thirty by 87.
2. Divide 81,763,809 by 985.
3. Take £683 14s. 7¾d. from £4,001 0s. 2¼d.

C. 1. Add together forty thousand pounds and sixpence, £417 18s. 3¾d., forty-three thousand and ten pounds, 18s. 4½d., seventeen shillings and a farthing, £936 18s. 9½d., and twelve guineas and fourpence.
2. Divide 367,801,490 by 56,080.
3. From £500 take 17s. 10¾d.

D. 1. Twenty million twenty thousand and twenty ÷ 89,607.
2. Take 7395 pence from £60.
3. From 870 cr. take 807 fl.

E. 1. How many threepences are there in 85,763½ guineas?
2. Add together 7 each of all our *gold* and *silver* coins.
3. How much are £675, 3827 cr., 8017 fourpences, and 7164 threepences?

F. 1. In dividing by 183 a boy got a remainder of 685; what is the true remainder?
2. 916,823 farth.—4127½ flor.
3. 91,782,426 ÷ (4689 × 15).

ADVANCED EXAMINATION.

1. A dealer bought 60,000 eggs at 9d. a score, and sold them at 7d. a dozen; how much did he gain or lose?
2. Out of £50 a man bought a horse for 42 guineas, and then spent the remainder, except 12s. 6d., in a saddle and bridle, the saddle cost 3 times as much as the bridle; find the cost each of the saddle and the bridle.
3. A boy earns 4s. 9d. a week, and his father earns 4s. 6d. for every shilling that he earns; how much do they both together earn in a week?

STANDARD IV.

A. 1. £973 15s. 8½d. × 35.
2. £789 10s. 10¾d. × 96.
3. £7689 17s. 6½d. ÷ 17.

B. 1. Multiply ninety-seven pounds thirteen shillings and ninepence farthing by 132.
2. From £76,809 17s. 8½d. take £9109 18s. 9½d., and divide the remainder by 807.
3. How many seconds are there from July 29th at 7.25 p.m. to the end of the year?

C. 1. £768,241 18s. 3¾d. ÷ 9083.
2. £83 17s. 9¾d. × 365; bring the product to farthings.
3. Bring eight million twelve thousand and seventeen ounces to tons, cwts., etc.

D. 1. How many square feet are there in 5 ac. 2 r. 20 per.?
2. £74,832 11s. 7¼d. ÷ 97,023.
3. How many inches in 9¾ miles?

E. 1. Multiply 15s. 6¾d. by 4444.
2. How many grains Troy are there in 28 lb. 10 oz. Avoirdupois?
3. If sugar be 3½d. a lb.; how many tons, cwts., etc., could be bought for £7070 2s. 0½d.?

F. 1. Bring 749 tons 15 cwt. 3 qr. 22 lb. to drams.
2. If books are 1s. 3¾d. each; how many could be bought for 138¼ guineas?
3. How many square inches are there in a square mile?

ADVANCED EXAMINATION.

1. A draper bought 600 yards of silk for £87 12s. 6d. He sold half of it at 4s. 6d. a yard, 140 yards at 3s. 9d., 36 yards at 2s. 9d., and the remainder at 2s. 3d.; how much did he gain?
2. A field of 20 acres was mown by 6 men in 5 days of 8 hours each, and they were paid at the rate of 7s. 6d. per acre; how much did each man earn per hour?
3. A traveller, who left home August 4th at 7.45 a.m., returned after an interval of 71,609 minutes; give the exact date of his return home.

STANDARD V.

A 1. 92,871 books at 1½d. each.
2. 64,183 ,, 2½d. ,,
3. 70,285 ,, 11½d. ,,

B. 1. 8175 books at 1s. 8½d. each.
2. 7083 ,, 5s. 9¾d. ,,
3. 9019 ,, 17s. 4¼d. ,,

C. 1. 91,085 articles at 7¼d. each.
2. 6081 ,, 18s. 6¾d. each.
3. 7195 ,, £15 16s. 2¾d. each.

D. 1. 9 yds. 3 qrs. 1 nl. at 9s. 6d. a yd.
2. Find the cost of 84 acs. 3 rds. 17 pers. at £56 12s. 8d. an ac.
3. If 5 rabbits cost 8s. 6½d., what would 131 cost?

E. 1. 51 mls. 5 fur. 36 pls. at £17 18s. 8d. a mile.
2. A bill—3½ yds. at 7s. 7d., 9¼ at 8s. 3d., 121 at 4½d., 38 at 2s. 4½d., and 865 at 2½d.
3. If 2¼ lbs. of tea cost 6s. 2½d., how many lbs. could be bought for £19 14s. 7½d.?

F. 1. A bill—3¼ cwt. at 4½d. a lb., 7¼ tons at 3s. 6d. a cwt., 18¼ lbs. at 10½d. a lb., 4½ cwt. at £7 12s. 6d. a ton, and 126 lbs. at 14s. 10d. a cwt.
2. What would 83,750 articles cost at £3 2s. 6d. a 1000?
3. 96 tons 16 cwt. 1 qr. 18 lbs. at £5 16s. 8d. a ton.

ADVANCED EXAMINATION.

1. Divide £52 10s. among 18 men, 12 boys, and 60 girls, so that a man shall receive six times as much as a boy, and a girl one and a half times as much as a boy. What will each girl get?
2. Make out neatly this bill—18¼ yds. of silk at 6s. 9d., 163½ yds. of linen at 1s. 4½d., 8¼ yds. of cloth at 11s. 9d., 3¾ yds. of velvet at 16s. 3d., and 28½ yds. of carpet at 3s. 9d.
3. If 10 men *or* 15 women can do a piece of work in 24 days, in what time could 8 men *and* 6 women do it?

STANDARD VI.

A. 1. $\frac{1}{2}+\frac{2}{3}+\frac{7}{8}+\frac{9}{10}+\frac{3}{4}$.
2. Take the least of the above fractions from the greatest.
3. Simplify $\frac{4}{5}$ of $1\frac{2}{3}$ of $\frac{5}{6}$ of $8\frac{3}{4}$.

B. 1. Take ·0045 from $2\frac{3}{8}$.
2. (·7485 × ·015) ÷ ·0005.
3. Multiply £7 13s. 6d by ·025.

C. 1. If 8 girls make 100 shirts in 16 days of 8 hours each, how many could 20 girls make in 6 days of 9 hrs. each?
2. Bring ·075 of £8 15s. to the v. f. of 17s. 6d.
3. What would $3\frac{1}{2}$ cwt. of coal cost at ·045 of £15 a ton?

D. 1. A can make a coat in 24 hrs., and B in 20 hours,—in how many days of 9 hours each could they together make 5 coats?
2. Multiply $\frac{6\frac{1}{2}}{9\frac{3}{5}}$ by $\frac{8\frac{3}{5}}{9\frac{1}{5}}$
3. (·07825 × 50·025) ÷ ·001.

E. 1. If 2·15 lbs. of cheese cost £·065, what would 8·44 cwt. cost?
2. A family of 8 persons cost £6 15s. in bread for 100 days when wheat was 50s. a quarter; what would 9 persons cost for a fortnight when wheat is 45s. a quarter?
3. If $\frac{2}{3}$ of $\frac{1}{4}$ of $\frac{1}{5}$ of a cwt. cost $4\frac{1}{8}$s., what would $\frac{3}{4}$ of $\frac{1}{8}$ of $\frac{9}{10}$ of $1\frac{1}{4}$ tons cost?

F. 1. Bring £·016 to the v. f. of 7s. 6d.
2. What would 3·145 tons cost at 3·083s. a cwt.?
3. If 50 logs of deal, each 12 feet long, 9 inches wide, and 3 inches thick, be worth £7 10s.,—find the value of 40 logs of oak each 10 feet long, 12 inches wide, and 8 inches thick,—the value of deal to oak being as 3 to 10.

ADVANCED EXAMINATION.

1. If 8 men, 10 women, 12 boys, *or* 16 girls consume 50 lbs. of beef in 11 days, how long would 1250 lbs. last 40 men, 60 women, 90 boys, *and* 100 girls?

2. A person pays four accounts consecutively. The first requires $\frac{1}{3}$ of his money, the 2nd requires $\frac{2}{3}$ of the remainder, the 3rd requires $\frac{3}{4}$ of what is left, and the 4th requires half of what is still left. He has £5 left. How much has he paid away?

3. If $115\frac{1}{2}$ tons of coal cost £$79\frac{7}{12}$, what fraction of a cwt. could be bought for $2\frac{1}{2}$d.?

STANDARD VII.

A. 1. Simple interest of £787 12s. 6d. at 5 per cent. for 3 years?
2. How much per cent. is 1s. $1\frac{1}{2}$d. in the £?
3. How much in the £ is $18\frac{3}{4}$ per cent.?

B. 1. What will £487 10s. amount to in $4\frac{1}{2}$ years at 4 per cent. per annum?
2. At what rate per cent. would £85 make 17s. 6d. interest in 2 calendar months?
3. By selling cheese at 8d. a lb., $22\frac{1}{2}$ per cent. was gained on the prime cost; find the prime cost per ton.

C. 1. What principal would make £4 9s. 7d. interest in 5 months at 5 per cent.?
2. Find the simple interest on £32 10s. for 100 days at $4\frac{1}{2}$ per cent.
3. If £250 he invested at 6 per cent., £150 at $4\frac{1}{2}$ per cent., and £350 at $3\frac{1}{2}$ per cent., what is the *average* rate for the whole?

D. 1. If £5 17s. 6d. be the premium paid for insuring a building at 3s. 9d. per cent., for what amount is it insured?
2. Find the compound interest on £725 for 3 years at 4 per cent.
3. If ·65 persons die weekly out of every 1000, what is the annual rate per cent?

E. 1. Find the discount on £45 paid 8 months before due at $3\frac{3}{4}$ per cent.
2. How much money must be invested in the 3 per cents. at $100\frac{1}{2}$ to yield £150 a year?
3. By selling hats at 3s. 9d. each, 25 per cent. is gained; what must they be raised to each to gain 30 per cent.

F 1. How much is ·0175 per cent. on $4\frac{1}{2}$ million sterling?
2. A bankrupt's assets amount to $67\frac{1}{2}$ per cent of his debts, and a person receives £17 10s. for an account due to him, find its amount.
3. In how many years would £3275 amount to £4000, at 4 per cent. simple interest?

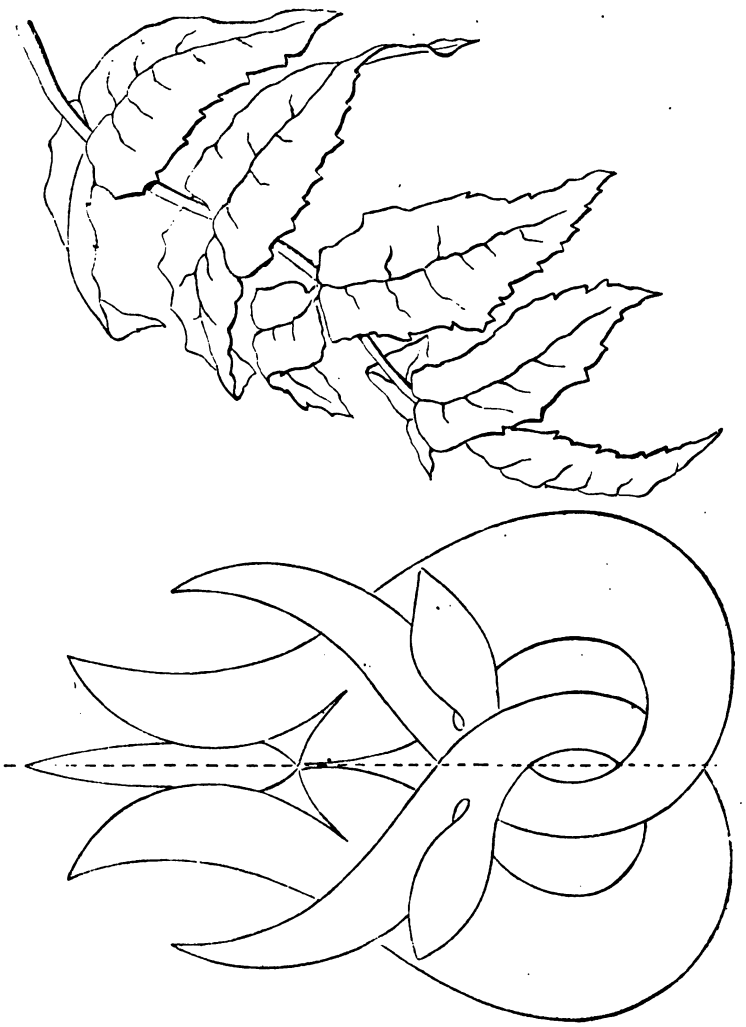
ADVANCED EXAMINATION.

1. A capitalist built 20 houses at a cost of £8750, which he lets at 25 guineas each. Two of them on an average are always empty, and of the rents due he loses 5 per cent. What rate per cent. interest will he get for his money, the cost of keeping in repair being $7\frac{1}{2}$ per cent. of the rents actually received?

2. A draper, whose sales average £22 10s. daily, gains 30 per cent. on the prime cost of his goods; find his profit in a year of 305 business days.

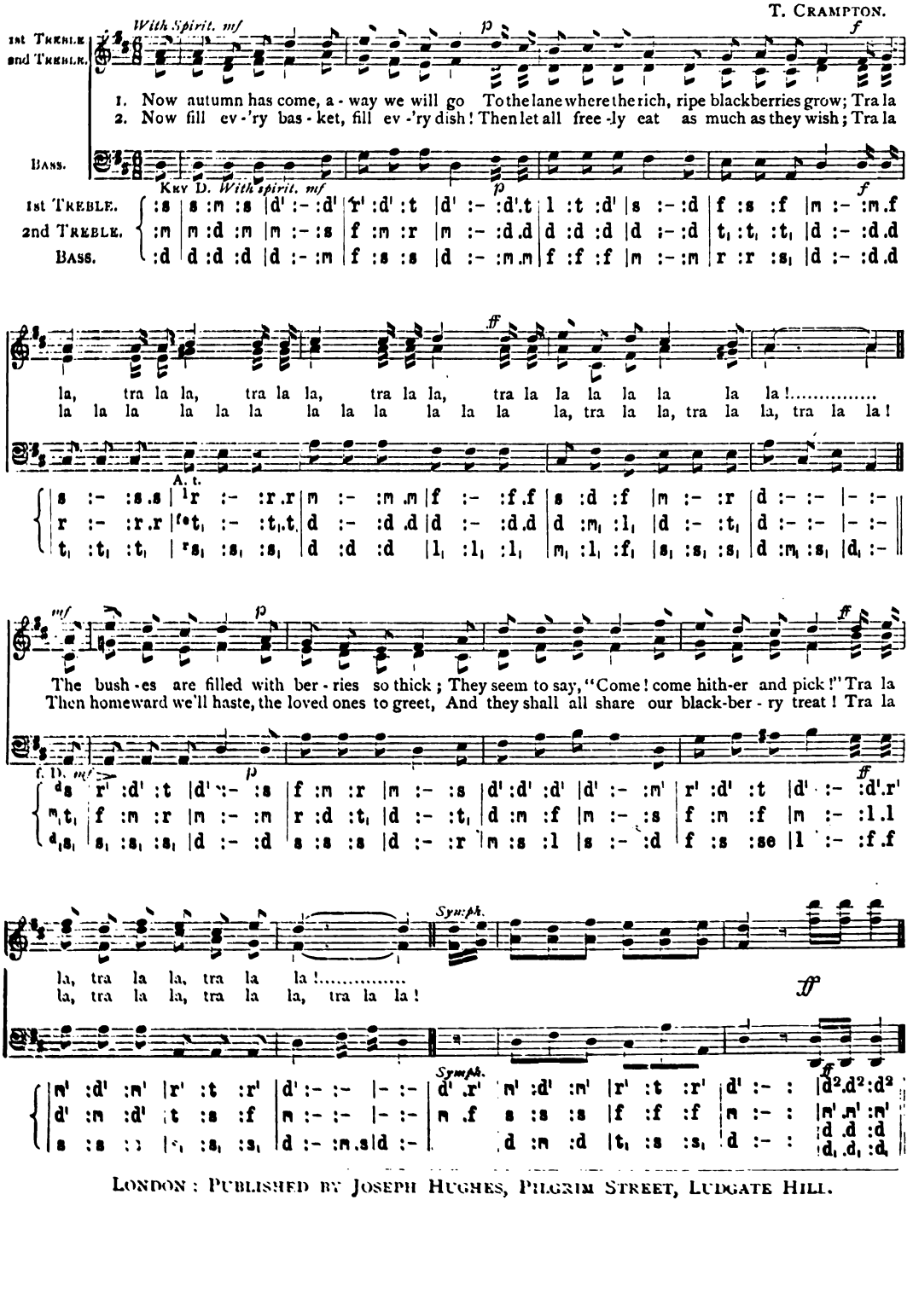
3. A person invests £5980 in a 4 per cent. stock at 92, and on its rising to 95 he sells out and reinvests in a 6 per cent. stock at $127\frac{1}{2}$. Find the alteration in his income.

Freehand Drawing Copies.

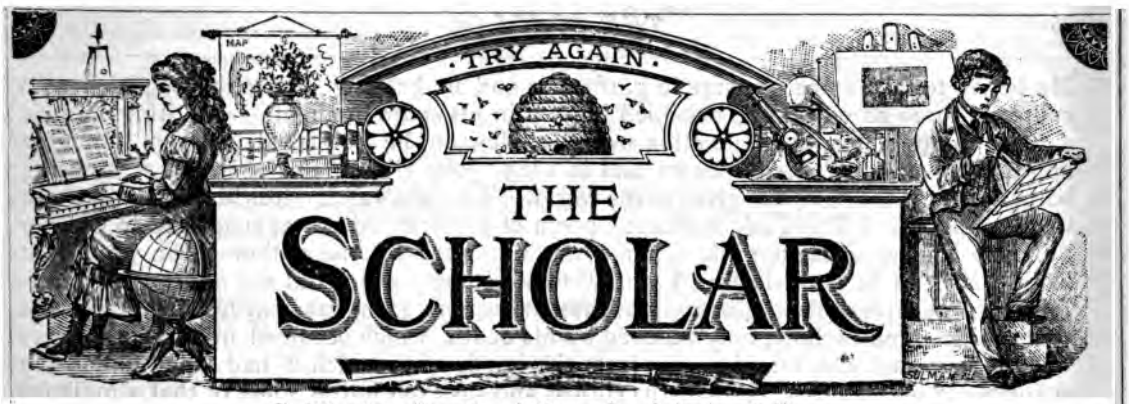


GOING A-BLACKBERRYING.

T. CRAMPTON.


1st TREBLE
2nd TREBLE.
BASS.
With Spirit. mf
p
f
1. Now autumn has come, a - way we will go To the lane where the rich, ripe blackberries grow; Tra la
2. Now fill ev -'ry bas - ket, fill ev -'ry dish! Then let all free -ly eat as much as they wish; Tra la
Key D. With spirit. mf
ff
la, tra la la, tra la la, tra la la, tra la la la la la la !.....
la la la la la la la la la la la la, tra la la, tra la la, tra la la !
A. t.
mf
The bush - es are filled with ber - ries so thick; They seem to say, "Come! come hith-er and pick!" Tra la
Then homeward we'll haste, the loved ones to greet, And they shall all share our black-ber - ry treat! Tra la
f. D. mf
Symph.
la, tra la la, tra la la !.....
la, tra la la, tra la la, tra la la !

LONDON: PUBLISHED BY JOSEPH HUGHES, PILGRIM STREET, LUDGATE HILL.



A Monthly Educational Paper for School and Home.
Conducted by JOSEPH HUGHES.

No. 8. Vol. I. OCTOBER, 1882. Price ½d. Per post, 13 copies for 7½d.

CONTENTS.

1. Gems from the Poets 85
2. Rhymes and Reasons in Domestic Economy 87
3. Up our Rivers.—VIII. The Clyde. With Map 88
4. Algebra 89
5. Freehand Drawing Copies 91
6. Arithmetic for Standares III., IV., V., VI., VII. .. 92
7. Music 94
8. Selection from the Press 95
9. Editor's Note 96
10. Dictionary 96

Gems from the Poets.

WILLIAM COWPER.

1731—1800.

WILLIAM COWPER, the son of a clergyman, was born at Great Berkhamstead, in November, 1731. He was educated at Westminster, where his excessive timidity and shyness helped to make his school-days anything but enjoyable. In accordance with the wishes of his father he entered the office of an attorney, in which one of his fellow-clerks was Thurlow, afterwards Lord Chancellor. He practised as a barrister for a few years, but he cared little for the law, and abandoned his legal studies for the more congenial pursuits of literature. About 1760, his mind became greatly agitated and deranged, and finally gave way altogether. He thrice attempted suicide, but was each time prevented from carrying out his intention. In time he recovered and took up his residence at Olney in Buckinghamshire, on the banks of the river Ouse. There he gave himself up to poetical composition. He had become acquainted with the Rev. John Newton, the rector of Olney, and with the Rev. Mr. Unwin, who, with his family, resided in that town, and these two gentlemen did much to dispel the gloom which almost constantly hung over the poet's mind, and to lead his thoughts in other directions.

[ALL RIGHTS RESERVED.]

He began to take some pleasure in gardening and in keeping domestic pets, such as a couple of tame hares, and he occupied himself in his spare moments by writing hymns, a collection of which, in conjunction with Mr. Newton, he published in 1779. In 1782 appeared his first volume of poems, and in 1783 'John Gilpin,' one of the most amusing ballads in our literature, was given to the world. Two years afterwards his most important work came out. 'The Task,' a didactic poem of the first order, was suggested to Cowper by Lady Unwin, whose original scheme was extended by the author to an important work. In 1791 he published a 'Translation of Homer,' which did not add to his fame. His mind, never free from gloomy fantasies, once more gave way, and his last years were spent in deep melancholy, only relieved by his death, which occurred in 1800. Cowper was the first poet who raised poetry from the low level to which it had fallen under the artificial influences of the eighteenth century, and instilled into it some of that simplicity which was afterwards so prominent in the writings of Wordsworth.

J. S. FLETCHER.

VERSES

*SUPPOSED TO BE WRITTEN BY ALEXANDER SELKIRK, THE ORIGINAL OF 'ROBINSON CRUSOE,' DURING HIS SOLITARY ABODE ON THE ISLAND OF JUAN FERNANDEZ.

I AM monarch of all I survey,
My right there is none to dispute;
From the centre all round to the sea,
I am lord of the fowl and the brute.
O Solitude! where are the charms
That sages have seen in thy face?
Better dwell in the midst of alarms,
Than reign in this horrible place.

I am out of humanity's reach,
I must finish my journey alone;
Never hear the sweet music of speech—
I start at the sound of my own.
The beasts that roam over the plain
My form with indifference see;
They are so unacquainted with man,
Their tameness is shocking to me.

Society, Friendship, and Love,
Divinely bestowed upon man,
Oh, had I the wings of a dove,
How soon would I taste you again!
My sorrows I then might assuage
In the ways of religion and truth—
Might learn from the wisdom of age,
And be cheered by the sallies of youth.

Religion! what treasure untold
Resides in that heavenly word!
More precious than silver and gold,
Or all that this earth can afford.

But the sound of the church-going bell
These valleys and rocks never heard,
Never sighed at the sound of a knell,
Or smiled when a Sabbath appeared.

Ye winds, that have made me your sport,
Convey to this desolate shore
Some cordial endearing report
Of a land I shall visit no more.
My friends—do they now and then send
A wish or a thought after me?
Oh, tell me I yet have a friend,
Though a friend I am never to see.

How fleet is a glance of the mind!
Compared with the speed of its flight,
The tempest itself lags behind,
And the swift-winged arrows of light.
When I think of my own native land,
In a moment I seem to be there;
But alas! recollection at hand
Soon hurries me back to despair.

But the sea-fowl is gone to her nest,
The beast is laid down in his lair,
Even here is a season of rest,
And I to my cabin repair.
There's mercy in every place,
And mercy—encouraging thought!—
Gives even affliction a grace,
And reconciles man to his lot.

THE LOSS OF THE 'ROYAL GEORGE.'

TOLL for the brave!
The brave that are no more!
All sunk beneath the wave,
Fast by their native shore!

Eight hundred of the brave,
Whose courage well was tried,
Had made the vessel heel,
And laid her on her side.

A land breeze shook the shrouds
And she was overset;
Down went the *Royal George*,
With all her crew complete.

Toll for the brave!
Brave Kempenfelt is gone;
His last sea-fight is fought,
His work of glory done.

*The story of 'Robinson Crusoe,' beautifully illustrated, will be begun in our next issue, which will form the first part of Volume II.—ED. S.

It was not in the battle;
No tempest gave the shock:
She sprang no fatal leak,
She ran upon no rock.

His sword was in its sheath,
His fingers held the pen,
When Kempenfelt went down
With twice four hundred men.

Weigh the vessel up,
Once dreaded by our foes!
And mingle with the cup
The tear that England owes.

Her timbers yet are sound,
And she may float again,
Full charged with England's thunder,
And plough the distant main.

But Kempenfelt is gone,
His victories are o'er;
And he and his eight hundred
Shall plough the wave no more.

Rhymes and Reasons in Domestic Economy.

BY MRS. WIGLEY,

Author of 'The Marshfield Maidens,' etc.

I.

FOOD called Nitrogenous builds up and makes us strong,
Food Carbonaceous yields heat to keep us warm;
While those parts that are mineral—our bones and nails and teeth—
Without the needful mineral food will surely come to grief.

Each kind of food has work to do, the work it can do best,
The work which is *its very own*, quite different from the rest;
And if, through careless management, we lack the right supply,
The part neglected suffers much, will slowly pine and die.

II.

SOME clever doctors are always at work finding out what each of us needs to keep us in health. You know how they go to work. They find out what there is in every healthy body, and then they try to find out what is wanting in bodies that are sick. It is something like this:—

Supposing you had a cake sent you that you liked very much indeed. You might say: 'If I can find out what there is in this cake I will make another like it,' and then you would set to work to take it to pieces, and taste and try until you were able to make out a pretty fair list. But when you had made *your* cake, you might find it was not so good. Then you would say: 'I have put too much of something, or else there is something left out,' and you would try again.

Doctors do almost the same sort of thing. They find a man sick, or perhaps dead, of some disease; then they look through the body and find out what there is too much of, or what there is wanting, and they generally can trace the evil to the right cause. If not, they try again.

III.

PERHAPS a mother comes one day with a little baby in her arms, with limbs that seem weak. 'I cannot tell what ails the child,' she says. 'He does not attempt to walk, and he is so backward with his teeth.' Then the doctor says, 'Perhaps you have not given the bones and teeth anything to make them grow. What have you been feeding him on?' If the mother can say, 'He has had plenty of sweet fresh milk,' the doctor knows that is good food for babies, and contains all the mineral food for bones that baby wants. But if she says: 'Oh, he always has some bread sop and sugar and a little tea,' then he knows it is all wrong, for no baby can grow strong bones without bone-making material.

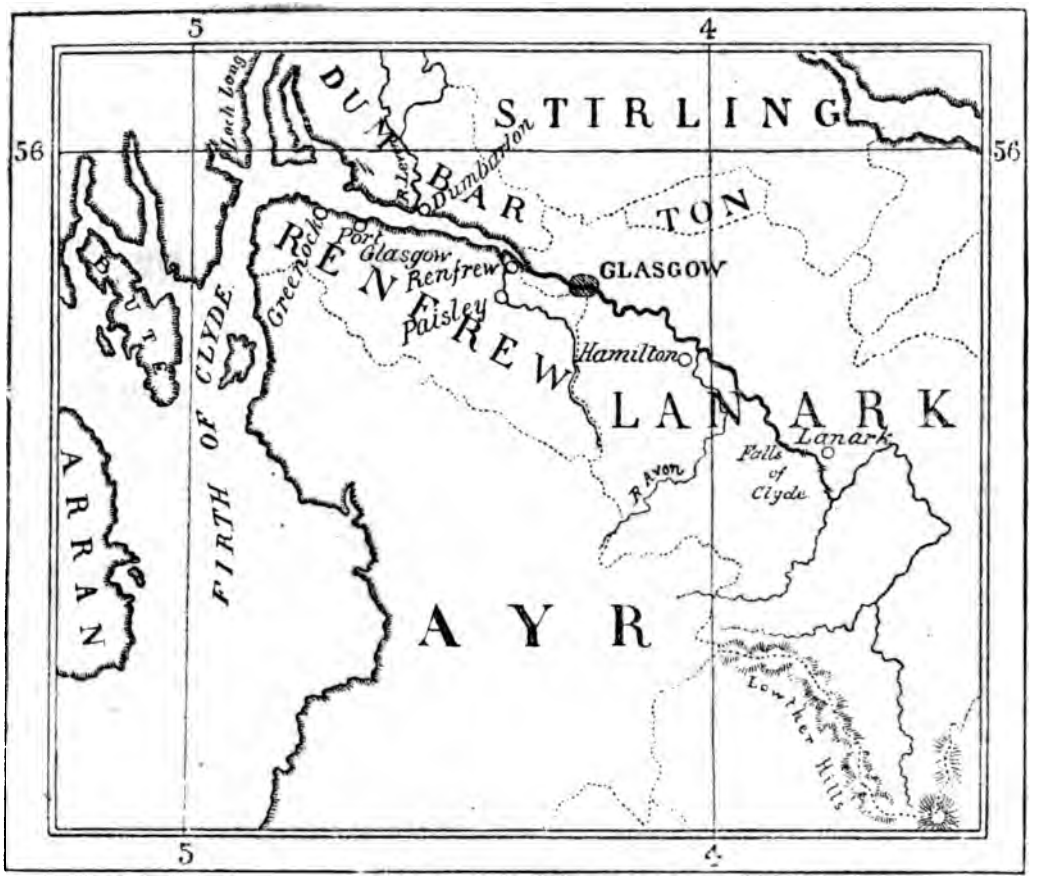
IV.

I KNOW a dear child with a bright little eye,
Which she keeps all the time on her teacher,
And if words sound grand and she can't understand,
She puckers up each little feature;
And then she will cry,
'Why, teacher? please why?'

'A man needs a pound of good food every day,
The warmth-giving food must be most,
For folks young or old must never grow cold,
Or else all their power will be lost.'
Then little bright-eye
Says, 'Please teacher, why?'

'You know when your hands are quite numbed with the cold
You cannot do anything right,
The needle will prick and the pen-point will stick,
And you don't feel good-tempered and bright.'
'No, I can't, though I try,'
Said little bright-eye.

'You may eat a good deal of the food to make strength,
Which keeps you from wasting away,
But without carbon food, you will find out at length
That the cold seems more numbing each day.'
'Yes, now I see why!'
Said little bright-eye.



Up our Rivers.

VIII.—THE CLYDE.

THE Clyde, whose course we purpose describing this month, is one of the most important of Scotch rivers, and has on its banks, or near to them, some of the largest towns and industrial centres of the country.

We will first imagine ourselves out in the middle of the Firth of Clyde, with the county of Ayr on our right, and the Islands of Arran and Bute on our left. Proceeding northward, we pass the Island of Cumbrae, and find the river mouth rapidly narrowing between Argyle and Renfrew.

At the entrance to Loch Long the Clyde takes a sudden bend to the eastward, and this part (widening to the northward into an arm of the sea called the Gareloch) may be called the real mouth of the river.

On the southern shore is situated Greenock, a town of 60,000 inhabitants, with a vast trade in ship-building and engine-making. On the same side, too, but a few miles further up-stream, is Port Glasgow, a town founded by the Glasgow magistrates in 1668, before the Clyde was

deepened, to act as a seaport for their town. It has in the present day a very flourishing trade of its own, and is one of the chief ports on the river for North American timber.

Turning our attention now to the county of Dumbarton, which lines the northern bank, we see no place of importance until we reach the mouth of the river Leven. This stream is a very small one, being only seven or eight miles long, and discharges the surplus water of Loch Lomond.

At its junction with the main stream is situated the ancient town of Dumbarton, with a fine old castle, built on a bold, isolated rock, overlooking the river. This fortress is one of the few in Scotland maintained, by the terms of the Union of the two kingdoms, in a state of repair at the public expense.

Still proceeding eastward, we reach Renfrew, a small town of 6,000 inhabitants, on the southern shore, on the banks of a small river called the Cart. On the same stream, about four miles to the south, is situated the large town of Paisley, celebrated for its manufactures of silk and other shawls, silks, muslins, and cotton thread.

Seven miles' journey on the main stream now brings us to Glasgow, the largest town in Scotland, having a population of more than half a million. It possesses a very ancient cathedral, founded in 1136, and very handsome university buildings.

Our course now lies south-east into the very heart of Lanarkshire.

At Hamilton, where the river Avon joins us on the right, there are manufactures of lace and silk, and in the park of the Duke of Hamilton hard by, are some of the original breed of wild cattle which formerly roamed through the land.

Still keeping the same direction, we reach the Falls of the Clyde, three in number, the highest about eighty feet in height. Lanark, the county town, lies on high ground near the river to the east.

After leaving the falls we find the river takes a sudden bend to the north-east, it then turns southward, and after tracing its course through the hilly but romantic scenery of South Lanarkshire, we find it originates in the extreme southern border of that county among the spurs of the Lowther Hills.

SUMMARY.

Source	Near Queensberry Hill, in the Lowthers.	Tributaries on right bank	Leven.
Course	Generally speaking, north-west.	Tributaries on left bank	Avon and Cart.
Length	About 100 miles.	Towns and places of interest on its banks	Lanark, Hamilton, Glasgow, Renfrew, Dumbarton, Port Glasgow, and Greenock.
Counties through which it flows.	Lanark, and between Dumbarton and Renfrew.		

Algebra.

BY W. H. HARVEY, B.A. (LONDON).

DIVISION.

The rules for Division, being the converse of those for Multiplication, will, we think, present no great difficulty to the learner.

Rule I.—When the divisor and dividend are unlike, division cannot practically be performed. We can simply express the result in a fractional form.

Ex. 1. Divide a by b.

$$a \div b = \frac{a}{b}$$

Ex. 2. Divide $3abc$ by $5abd$.

$$3abc \div 5abd = \frac{3abc}{5abd}$$

In this example, however, it will be noticed that some of the letters in the numerator occur also in the denominator. We can, therefore, bring our answer into a more compact form by cancelling these terms, just as we should do in the case of a fraction in arithmetic.

$$\therefore \frac{3abc}{5abd} = \frac{3c}{5d}$$

Rule II.—To divide a power of a certain letter by a lower power of the same letter.

Write down that letter as the quotient, and for its index subtract the index of the divisor from that of the dividend.

Ex. 3. Divide x^7 by x^4.

$$\frac{x^7}{x^4} = x^{7-4} = x^3$$

This follows from the rules previously laid down for Multiplication. For, in a Division sum, the

Quotient × Divisor = Dividend,

Therefore in the above example,

Quotient × $x^4 = x^7$

And it is very clear that the Quotient must be x^3, and x^3 only, to produce, when multiplied by x^4, the product x^7.

NOTE.—When a term is divided by itself, the quotient = 1:

For example,

$$a \div a = 1$$
$$x^2 \div x^2 = 1.$$

Rule III.—To divide one simple term by another.

Divide the numerical co-efficient of the divisor into that of the dividend, and subtract the index of each letter in the divisor from that of the like letter in the dividend, as in the following examples.

Ex. 4. Divide $36x^3y^2z^2$ by $4xyz$.

$$36x^3y^2z^2 \div 4xyz = 9x^2yz$$

Ex. 5. Divide $3030ab^3c$ by $5bc$.

$$5bc)3030ab^3c\ (606ab^2$$

It will be noticed in the last example that the letter c does not occur in the quotient $606ab^2$. This follows from what has been mentioned in the note to Rule II., viz., that a term divided by itself gives 1. So that the quotient $606ab^2$ should be, if fully expressed, $606ab^21$; but as the figure 1 does not affect the value of the expression, it is omitted.

Rule IV.—The rule for the signs is the same as in Multiplication, *i.e.*, like signs in the divisor and dividend necessitate the introduction of + before the quotient; unlike signs, the introduction of −.

Ex. 6. Divide $+36a^3b^3c^2$ by $+6abc$.

$$+36a^3b^3c^2 \div +6abc = +6a^2b^2c$$

Ex. 7. Divide $80x^2yz$ by $-10xy$.

$$+80x^2yz \div -10xy = -8xz$$

EXERCISE XII.

(1) Divide m by n: pq by rs: x by y.
(2) Divide abc by def: pqr by xyz.
(3) Divide x^7 by x^3: a^5 by a^2: a^3b^2 by ab.
(4) Divide a^3b^3 by ab^2: m^2n^6 by mn.
(5) Divide a^3 by a^3: m by m: x^5 by x^5.
(6) Divide $+72a^5b^2c^3$ by $+6a^4bc$ and $+81x^4y^3z$ by $-9x^2y^2z$.
(7) Divide $30015ab^2c^3$ by $5bc^2$.
(8) Divide $-672a^3b^2c^5$ by $-6ab^2c^3$.
(9) The sum of x pounds are to be divided equally amongst y people. What is each person's share?
(10) Divide $-300x^2y$ by $-5x^2y$.

Rule V.—When the dividend consists of more than one term we divide the divisor consecutively into each of the terms of the dividend, as in the following example:—

Ex. 8. Divide

$$12x^2y^2z - 8xyz^2 - 4xy^2z^2 \text{ by } -4xyz.$$

$$-4xyz)\ 12x^2y^2z - 8xyz^2 - 4xy^2z^2$$
$$-3xy^2 + 2z + yz^2$$

Rule VI.—When both the divisor and the dividend contain more than one term, the method of dividing is as follows:—First arrange both dividend and divisor according to the powers of some common letter.

Thus, if it is required to divide

$$-7ab - 10b^2 + 12a^2 \text{ by } 2b + 3a,$$

we must first arrange the terms of the two expressions, so that the highest or lowest power of some common letter occurs in the first term, and the other powers of that letter in their order. Thus, if we take a to be the common letter, and we place the highest power in the first term, the arrangement will be as follows:—

$$3a + 2b)12a^2 - 7ab - 10b^2($$

Then divide the first term ($12a^2$) of the dividend by the first term ($3a$) of the divisor, and set down the result ($4a$) for the first term of the quotient.

Multiply every term of the divisor ($3a + 2b$) by the first term of the quotient ($4a$) thus obtained. Subtract this product ($12a^2 + 8ab$) from the dividend. Bring down the next term ($-10b^2$) of the dividend to join with the remainder ($-15ab$), and repeat the whole operation by dividing the divisor into the fresh line ($-15ab - 10b^2$) thus obtained in the same way as before.

Subjoined is the full working:—

$$3a+2b)12a^2 - 7ab - 10b^2(4a - 5b$$
$$12a^2 + 8ab$$
$$-15ab - 10b^2$$
$$-15ab - 10b^2$$

Ex. 9. Divide $26a - 18a^2 + 9a^3 - 24$ by $3a - 4$.

Alter the arrangement and proceed as below:—

$$3a-4)9a^3 - 18a^2 + 26a - 24(3a^2 - 2a + 6$$
$$9a^3 - 12a^2$$
$$-6a^2 + 26a$$
$$-6a^2 + 8a$$
$$18a - 24$$
$$18a - 24$$
$$\ldots \quad \ldots$$

Ex. 10. Divide x^3+y^3 by $x-y$.

$$
\begin{array}{l}
x-y)x^3+y^3(x^2+xy+y^2 \\
\quad x^3-x^2y \\
\quad\quad +x^2y+y^3 \\
\quad\quad +x^2y-xy^2 \\
\quad\quad\quad\quad xy^2+y^3 \\
\quad\quad\quad\quad xy^2-y^3 \\
\quad\quad\quad\quad\quad +2y^3
\end{array}
$$

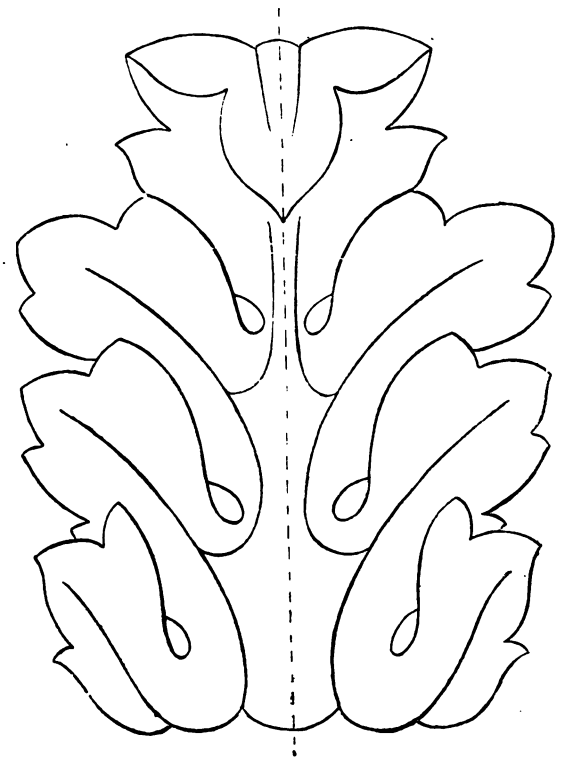
In this example there is a remainder $+2y^3$, which may, of course, just as in an ordinary sum of arithmetic, be expressed as a fraction and appended to the quotient, so that the answer is—

$$x^2+xy+y^2+\frac{2y^3}{x-y}$$

EXERCISE XIII.

(1) Divide $x^2yz+xy^2z+xyz^2$ by xyz.
(2) Divide $4ab^2-16a^2b+24a^2b^2$ by $4ab$.
(3) Divide $a^2x^2-5a^3x+2a^2x^3-3ax$ by $-ax$.
(4) Divide $a^3-3a^2x+3ax^2-5a^2x^2$ by $2a$.
(5) Divide $-60x^4y^3z^2+25x^3y^3z^3-30x^2y^4z^5$ by $-5x^2yz^2$.
(6) Divide $a+b$ by $a+b$; $-3a+3b$ by $a-b$.
(7) Divide a^2-b^2 by $a-b$.
(8) Divide $a^2-2ab+b^2$ by $a-b$.
(9) Divide $-2x^2y+x^3-3xy^2$ by $x+y$.
(10) Divide $9x^2-16y^2$ by $3x+4y$.
(11) Divide $6x^2-16xy+8y^2$ by $2x-4y$.
(12) Divide x^2+6x+5 by $x+1$.
(13) Divide $a^4+71a^2-18a^3-220+112a$ by $a^2-10a+11$.
(14) Divide $16x^4-81y^4$ by $2x-3y$.
(15) Divide a^6-6a+5 by a^2-2a+1.
(16) Divide $1+2x$ by $1-3x$ to four terms in the quotient.

Freehand Drawing Copies.



Arithmetic. BY W. SPENCER.

STANDARD III.

A. 1. Divide 81,743 by 17.
2. Divide 918,649 by 47.
3. Divide ninety thousand by 307.

B. 1. (61,785 × 49) ÷ 59.
2. Take 17s. 2¾d. from £40.
3. Bring £98 17s. 5d. to pence.

C. 1. Add ninety pound and fourpence, £472 18s. 2¾d., five hundred pound, £17 12s. 6¾d., sixty-six pound eleven shillings, and £8,012 19s. 8¾d.
2. Divide seven hundred and fifteen thousand and nineteen by 860.
3. From £600 1s. 1d. take 1s. 4¼d.

D. 1. Divide the difference between half a million and 47,631 by 8063.
2. Bring 617,835 farthings to £ s. d.
3. How many halfpenny postage stamps could be bought for £5 17s. 9d.

E. 1. If five oranges cost 2d., what would 1000 cost?
2. Divide 6 million 12 thousand and 15 by 80,091.
3. Bring 817,649 three-penny bits to £ s. d.

F. 1. Take 817 farthings from £817.
2. How much more or less than £100 are £17 18s. 2½d., £75 14s. 8d., and 18s. 4¾d. added together.
3. If ducks are 2s. 10½d. each, how many could be bought for £69 14s. 4½d.?

ADVANCED EXAMINATION.

1. A school excursion consisting of 200 children and 60 adults cost £20, the children being charged a farthing a mile, and the adults a half-penny. How many miles did they travel?

2. If a turkey be worth a goose and a hare, and if a hare be worth 3s. 6d., and a turkey worth 3½ times as much, find the value of 20 geese.

3. From eighty thousand and forty-nine guineas take seventy-five million three hundred and six thousand and thirteen farthings. Give the answer in £ s. d.

STANDARD IV.

A. 1. £73 14s. 8¾d. × 11.
2. £286 17s. 4½d. × 25.
3. £6178 16s. 2¾d. ÷ 7.

B. 1. (£8000 − £347 18s. 2½d.) ÷ 9.
2. Bring 4 ton 13 cwts. to ozs.
3. Multiply £76 18s. 3¾d. by 77.

C. 1. Divide £871 3s. 8d. by 273.
2. How many shirts, each requiring 3 yds. 1 qr. 1 nl., can be made out of 200 yards?
3. Bring 817,635 grs. to lbs. ozs., etc.

D. 1. How many boys could dine out of 26 lbs. 13 ozs. of beef, each requiring 3½ ozs.?
2. What would 2½ pints of milk daily cost at 3½d. a quart for the 3 months of Oct., Nov., and Dec.
3. Divide £87 14s. 9¾d. by 4087.

E. 1. If 3½ tons of hay cost £14 12s. 3d., what would 4½ tons cost?
2. What would 90 score articles cost at 7s. 4½d. a dozen?
3. Bring 7161 inches to yds. qrs. nls.

F. 1. How many square feet are there in 1 acre 1 r. 1 p.?
2. A dealer bought a number of eggs at 5 for 3d., and sold them at 6 for 5d., he gained a guinea by them. Find the number of eggs.
3. Find the difference in ounces between 615 tons and 615 cwt.

ADVANCED EXAMINATION.

1. Find the total cost of excavating and carting 1½ miles 8000 cubic yards of earth, the former costing 9½d. a cubic yard, and the latter 10d. a ton per mile, a cubic yard weighing 1 ton 2 cwts. 2 qrs.
2. A workman was engaged for 20 days at 4s. 9d. a day, but on account of absence from work he only received as payment £4 3s. 1½d. How many days was he off work?
3. If 12 ton 14 cwt. 2 qr. 26 lb. of hay be eaten by 112 horses and 118 cows in 10 days, a cow eating 13½ lb. daily, how much did each horse eat a day?

STANDARD V.

A. 1. 7085 slates at 1½d. each.
2. 9183 „ 4½d. „
3. 7481 „ 8½d. „

B. 1. A bill,—3½ lb. at 6s. 9d., 8½ lb. at 3s. 6d., 11½ lb. at 1s. 9d., and 2½ lb. at 2s. 7d.
2. 8179 caps at 1s. 9½d. each.
3. If 3 yards cost 2s. 2¼d., what would 60 yards cost?

C. 1. 7643 at 8s. 1½d.
2. 15 ton 16 cwt. 1 qr., at £4 12s. 4d. a ton.
3. A bill,—140 at 2½d., 68½ at 2s. 6d., 128 at 6¾d., and 905 at 1½d.

D. 1. 8715½ at £6 18s. 4d.
2. 68 yd. 2 qr. 3 nl. at 5s. 6d. a yd.
3. If 7 cricket balls cost 23s. 2¼d., how many for £18 17s. 7½d.?

E. 1. What would ½ million bricks cost at 37s. 3d. a 1000?
2. What would 43,680 lb. cost at £5 16s. 3d. a *ton*?
3. 45 ac. 3 r. 16 per. at 11s. 8d. an ac.

F. 1. If 7½ cwt. of coal cost 6s. 9d., what would 48¾ ton cost?
2. 36,288 needles at 9¾d. a gross.
3. 8975 at £5 19s. 11¾d. each.

ADVANCED EXAMINATION.

1. Calculate and receipt the following bill:—14¼ yds. of silk at 4s. 9d., 243½ yds. of calico at 5½d., 7¾ yds. of velvet at 16s. 9d., 48½ yds. of linen at 1s. 4½d., and 2⅞ yds. of crape at 5s. 6d.
2. A, B, and C build a wall 92 yds. long, A doing 4 yds. more than B, and B 8 yds. more than C; what length was built by C?
3. If three million six hundred thousand pins be bought at 1s. 3¾d. a 1000, and sold at 4½d. a gross, how much is gained?

STANDARD VI.

A. 1. Add together $\frac{2}{5}$, $\frac{3}{4}$, and $\frac{1}{2}$.
2. Take $\frac{2}{3}$ of $\frac{1}{2}$ from $\frac{3}{4}$.
3. Divide $4\frac{3}{8}$ by $\frac{1}{2}$ of $\frac{3}{4}$.

B. 1. ·015 + 3·1 + ·175 + 9.
2. (·715 − ·0715) ÷ 12·5.
3. Bring 5¼d. to dec. of £20.

C. 1. If 8 lb. of beef cost 5s. 6d., what would 40 of pork cost, beef being to pork in value as 10 to 7.
2. ·08375 ton at 2·8d. a lb.
3. Bring $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{4}{5}$ of 8s. 6d. to the fraction of a £.

D. 1. $(\frac{4}{5}$ of $19\frac{3}{5}) \div (\frac{5}{8}$ of $6\frac{4}{5})$.
2. Bring £4 15s. to dec. of £5 15s.
3. In how many days of 10 hours each could 20 men make 500 pair of boots, if 8 men make 60 pair in 6 days of 9 hours each?

E. 1. Bring ·00625 ton to the v. f. of 150 lb.
2. What would $1\frac{7}{8}$ lb. of sugar cost, if $3\frac{5}{8}$ ton cost 100 gs.?
3. In a race of half a mile, the winner beat by 20 yds.; give the ratio of speed of winner to loser.

F. 1. What would ·0175 of 2500 ton cost at 3½d. a lb.?
2. From $\frac{4}{5}$ of $5\frac{3}{4}$ take $\frac{3}{8}$ of $3\frac{2}{5}$; then divide the remainder by the difference between $8\frac{1}{4}$ and $5\frac{5}{8}$.
3. If 3 pints of new milk daily in London for the month of October cost £1, find the cost of 8 pints of skimmed milk daily in the country for November, the cost in London to country being as 8 to 5, and skimmed to new milk as 2 to 5.

ADVANCED EXAMINATION.

1. If 8 horses draw 160 ton to a distance of 3 miles in 4 days of 10 hours each, and 12 donkeys draw 180 tons 5 miles in 16 days of 8 hours each, find the ratio of effective work between a horse and a donkey.

2. After taking out of a bag $\frac{5}{8}$ of its contents, $\frac{3}{5}$ of the remainder was found to be £3 17s. 9d. What did the bag contain at first?

3. If a lb. of wheat produce ·88 lb of flour, and a lb. of flour 1·15 lb. of bread, and if a regiment of 850 men consume 3·55 tons of wheat in 6 days, find each man's daily ration of bread in lbs. and dec.

STANDARD VII.

A. 1. Find the interest of £375 at 4 per cent.

2. What is the interest of £677 10s. for 3 years at 5 per cent.?

3. What per cent. is 650 out of 10,000?

B. 1. Find the amount of £786 5s. in 2½ years at 3 per cent.

2. Add 22 per cent. to 12s. 6d.

3. At what rate per cent. would £650 make £85 interest in 3½ years?

C. 1. What is the cash value of £8775 in 3 per cents. at 92½.

2. Shawls were bought at 18s. 6d. each and sold at 17s. 3d.; find the loss per cent.

3. In how many years would £865 amount to £1000 at 6 per cent.?

D. 1. What principal would amount to £850 in 3 years at 5 per cent.?
2. If the commission on £37 10s. be 18s. 9d., what is the rate per cent.?
3. A bankrupt pays 72 per cent. of his debts; how much would a person lose to whom he owed £16?

E. 1. How much per cent. is 8s. 4½d. in the pound?
2. By selling sugar at 2½d. a lb. 5 per cent. is lost; find the prime cost per cwt.?
3. Find the compound interest of £750 for 4 years at 4 per cent.

F. 1. What annual income would be obtained from investing £5000 in a 4½ per cent. stock at 110?
2. If 18 per cent. be gained by selling linen at 1s. 4d. a yard, how much additional per cent. would be gained by raising it 2d. a yard?
3. Find the present worth of £80 paid one month before due at 4 per cent.

ADVANCED EXAMINATION.

1. A person invests £2450 10s. in the 4 per cents. at 84½, and on their rising to 88 he converts his capital into railway stock at 70, paying a dividend of 3½ per cent.; find the alteration in his yearly income.

2. A dealer bought 80 horses for two thousand guineas, and sold 25 of them at £35 each, and 30 at £32 each; at what each must he sell the remainder to gain 30 per cent. on his outlay?

3. A person owes £85, not yet due, for which he pays prompt cash, £83 7s. 6d., discount being at 4 per cent.; how many months had the bill to run?

(The Answers to the Arithmetic and Algebra appear in the October number of the *Practical Teacher* and the *Governess.*)

Complete Answer Cards may also be had, price ½d. each.

N.B. -In future, the answers of one number will appear in the succeeding number, in addition to being published in the above forms.—ED. *S.*

NUTTING SONG.

Music by T. CRAMPTON.

Allegretto. mf
1st Treble.
2nd Treble.
Bass.
1. When gold-en au-tumn comes a-long, With splendid col-ours glow-ing; When gai-ly rings the
2. The birds are sing-ing in the trees, The squir-rels shy-ly peep-ing; While fall the nuts with
3. Oh! spring is sweet, and sum-mer fair—We sing their charms to-ge-ther; But nought is half so
KEY G. Allegretto. mf
D. t.
reap-er's song; When har-vest fields are mow-ing: Oh, what so gay, to haste a-way, In
ev-'ry breeze, A rhyth-mic pat-ter keep-ing: A-way we stray where sun-beams play, A-
bright and rare As gold-en au-tumn wea-ther: We sing her praise in joy-ous lays, And
f. G.
plea-sant au-tumn wea-ther, With hearts so free and full of glee, The ri-pened nuts to ga-ther?
-mid the woodland reach-es; Like birds in spring our voi-ces ring A-mid the oaks and beech-es.
when the nuts are fall-ing—O'er hill and dale, up-on the gale, A-way! our songs are call-ing.
D. t.
CHORUS.
Symph.
Hur-rah! hur-rah! The ri-pened nuts to ga-ther!
Hurrah! hurrah!
f. G. CHORUS.
Symph.

Selection from the Press.

WEIGHTS AND MEASURES.

Most people are aware that for practical purposes they carry in their pockets very simple weights and measures. Half a crown is half an ounce; five shillings in one balance of a scales will equipoise a letter which a penny stamp will carry in a closed envelope; and, when the weight of foreign letters was a little more intricate than now, the ordinary bronze penny represented the unit allowed for French and German correspondence. There is little difficulty now about fixing the standard, but in early times, when science had not attained its present exactness, there were constant bickerings and wrangles. Perhaps the first successful attempt to obtain uniformity was achieved by Henry I., who settled the matter by a decision curiously arbitrary and final. The yard was to be the standard of every measure, and the length of the yard was not a matter of feet or inches, but was laid down once for all as the length of the King's arm. The decision was apparently simple, and intended to be final. The King often settled in person matters of dispute between his subjects, and, in differences as to questions of measurement, there could always be a ready reference to the Royal arm. In Edward II.'s time a new criterion was hit upon. The standard was settled by statute, which ordained that 'three barley-corns sound and dry should make an inch.' As compared with measurement by the Royal arm this standard was almost democratic in its suggestion, but the barleycorn showed unmistakably the predominance of the agricultural interest. The inch being thus ascertained, it was easy to construct from that datum the foot, yard, perch, and even the acre. The barleycorn, indeed, figures constantly in attempts to arrive at the methods of computation. The object, however, seems to have been to get a standard that was accessible rather than one that was invariable. The authorities realized that seeds plucked from the full ear were more popular as a reference than the proportions of the Royal arm. What was done with the inch had already been done with the ounce. The consent of the whole realm was obtained to the proposal put forward in the fifty-first year of Henry III. that twenty pennies should make an ounce, and that one penny should weigh thirty-two wheat-corns taken from the midst of the ear of corn. And so matters stood for many years.

Perhaps it is within the present century that we are to date the first fixing of a really scientific standard. Here is a resolution of a Committee of the House, arrived at in 1814, and dealing with the subject:—'The length of a pendulum vibrating seconds in the latitude of London has been ascertained to be 39·13047 inches, of which the standard yard contains thirty-six.' By-and-bye, however, the pendulum theory was rejected. The substituted scheme was to provide for the restoration of standards by means of material copies which had been compared with them. For years the scientific men wrote, and consulted, and corresponded, and argued. The different standards, or rather examples of the standard, were found to disagree, and at last a mean was struck among all the varieties and the standard yard ascertained. It was in 1834 it was lost. It was in 1853 that it was constructed and deposited at the Exchequer. It is a bar thirty-eight inches long, and the thirty-six inches are measured on this. There is very learned language in the report describing how this measurement is made—language so learned as to be unintelligible except to quite an expert in scientific phraseology. This standard yard, as materially defined, is packed up in a box side by side with another box, which contains the standard 1lb. The yard is buried in mahogany, and the 1lb. in oak, and both are secured in a kind of stone coffin, and sunk in the vaulted strong room of the Exchequer.

So much for ourselves. In France they order these matters otherwise. They have been scientific, and have stuck to their science. The *metre* is the ten-millionth part of the distance from the Equator to the Pole, and, as that distance is not likely to alter, there is no primary need for the establishment of a standard which may be verified and then buried away. We fixed our unit of length in 1760. We lost it in 1834, and then we recovered it in 1853—at least an Act of Parliament says so. But the French have been at once more practical and more scientific. No burning of the Hotel de Ville or the Chamber of Deputies can destroy their standard. It will last so long as the distance from the Equator to the Pole endures.—*Globe.*

Editor's Note.

WITH this number we close our first volume. Our subscribers will be pleased to hear that THE SCHOLAR has by far the largest circulation of any educational paper in the world. For this gratifying success we tender our warmest thanks to all who have interested themselves on our behalf. Vol. I., with an appendix containing all the answers to the Algebra and Arithmetic, may now be had in a strong paper binding, price 6d. (post free). A beautifully bound prize edition is also now ready, price 1s. 6d.

In future, the answers to the Arithmetic, etc., of one number, will appear in the succeeding number. Thus the answers to No. 1, Vol. II., will be published in No. 2, Vol. II., and the answers to No. 2. in No. 3. and so on. By this arrangement it is hoped general satisfaction will be given. The answers will, as heretofore for the convenience of teachers, be printed on halfpenny cards and also in *The Practical Teacher* and *The Governess*. The following is the

PROSPECTUS OF THE NEW VOLUME,

the first number of which will be published on October 20th, 1882.

1. Robinson Crusoe (beautifully illustrated).
2. Shakspere's Richard II., with notes, by one of Her Majesty's Inspectors of Schools.
3. Selections from the Press.
4. Twelve original School Songs in both Notations.
5. Arithmetic, by W. SPENCER.
6. *Second Grade* Freehand Drawing Copies.
7. How we are made (Animal Physiology).
8. Domestic Economy Lessons, by Mrs. WIGLEY.
9. Short Stories.
10. Composition. Hints for Beginners.
11. Dictionary (with derivation of words).
12. Prize Competitions.

We should be especially thankful to our young friends if they would kindly make the Magazine as widely known as possible. There is no reason why our subscribers should not be numbered by hundreds of thousands.

***** Henceforth THE SCHOLAR will be sent Post Free at 6d. per Dozen.**

Dictionary.

EXPLANATORY LIST OF THE MORE DIFFICULT WORDS OCCURRING IN THIS NUMBER.

Achieved, made, done.
Agricultural, farming.
Assuage, to soften, allay.
Attained, reached.
Computation, reckoning.
Congenial, suitable.
Criterion, standard.
Didactic, intended to teach, instructive.
Equipoise, exactly balance.
Fantasies, fancies.
Intricate, puzzling.
Isolated, standing alone, detached.
Main, the *main* sea, the ocean.
Phraseology, style of language.
Predominance, superior weight.
Primary, original, first.
Sages, wise men.
Scheme, plan.
Verified, shown to be true.
Vibrating, swinging backwards and forwards.

WORDS, SOMEWHAT DIFFICULT IN SPELLING, NOT OCCURRING IN THE ABOVE LIST.

Arbitrary.	**Curiously.**	**Mahogany.**	**Pendulum.**
Artificial.	**Democratic.**	**Management.**	**Reaches.**
Ascertained.	**Envelope.**	**Measurement.**	**Reconciles.**
Century.	**Foreign.**	**Occurred.**	**Statute.**

LONDON: PUBLISHED BY JOSEPH HUGHES, PILGRIM STREET, LUDGATE HILL.

ANSWERS TO ALGEBRA.

EXERCISE I. Page 9.

(1) 15 (2) 30 (3) 3
(4) 5 (5) −12 (6) 24
(7) 78 (8) 13 (9) 2400
(10) −120 (11) $16\frac{1}{2}$ (12) $\frac{1}{12}$
(13) 24 (14) 8 (15) $8\frac{1}{4}$
(16) $\frac{8}{15}$ (17) $48\frac{1}{3}$ (18) −10
(19) $a+b$, $a-b$, ab, and $\frac{a}{b}$ (20) $240x$ pence
(21) $\frac{x}{y}$ £ each. (22) $\frac{x}{2}$, $2x$, $x-y$

EXERCISE II. Page 21.

(1) 2, 2, 2, 3, 3, a, a, a, b, b, c (2) 17 and $\frac{1}{2}$
(3) $10bc$, and $15abc$

EXERCISE III. Page 22.

(1) $6aaabbbbc$ and $xxxyyz$ (2) 35
(3) 99 (4) 85 (5) 128
(6) $11\frac{2}{3}$ (7) $14\frac{2}{3}$ (8) 31
(9) 126 (10) 6075 (11) 42525 sq. ft.
(12) 1296

EXERCISE IV. Page 22.

(1) $a+b+c+d+e+f$ (2) $a-b-c-d-e-f$
(3) 15 (4) $a+b-c-d+e-f$
(5) $a-b-c+d+e-f+g$ (6) $a^2-bc-c+dc-f-g$
(7) $a^2-b^2+c^2-bc+g-h$

EXERCISE V. Page 41.

(1) $\frac{3b}{2}$ (2) $\frac{35ab}{4}$ (3) $-\frac{2x}{2}$
(4) $-6xy$ (5) $\frac{83ab}{42}$

EXERCISE VI. Page 41.

(1) $-10b$ (2) $8abc$ (3) $6xyz$
(4) $8cde$ (5) $-2a+3b-7c$
(6) $20x$ pounds and $4y$ shillings.
(7) $\frac{a}{2}$ (8) $3a+\frac{3}{4}b+2c$
(9) The terms destroy one another. Ans. 0.
(10) $9(a+b)$.

EXERCISE VII. Page 42.

(1) $3x+4y+5z$ (2) $3a-5b-6bc+4a$.
(3) $9a+5b-3c+2d+e-f$
(4) $15x^2-60y^2-22^2$ (5) $-5a+4b+c-2d+7$
(6) $4x^2+2a^2+2b^2$ (7) $-3a+10b+5d$
(8) $5a+2b-6c+3d$ (9) $28(a+b)-15(c+d)$

EXERCISE VIII. Page 54.

(1) $x-y$, $x-a-b$ (2) $8a^2bc$
(3) $3a+2b-3c$ (4) $48xyz$
(5) $6a-3b+8c+1$ (6) $3x^3-9x^2+10x-14$
(7) $x+y+z-a-b-c$ (8) $a+c$
(9) $-b+c$ (10) $(x+y)-(x-y)$

EXERCISE IX. Page 66.

(1) $abxy$, $abcxyz$, mn, $abcpqr$
(2) a^2, x^2, a^2b^2, $b^2d^4e^3$
(3) xy^2z^2, ab^3c^2x, abx^2y^4
(4) $21a^2b^2$, $90x^3yz^2$, $480m^3n$
(5) x^2y^2z, $-40ab^2c$, $-30a^2b^4c$
(6) $300a^3b^4c^5x$ (7) $4abx$ letters (8) $480x$ pence

EXERCISE X. Page 77.

(1) $a^3+a^2b+ab^2+b^3$
(2) $a^3+a^2b+ab^2+ac^2+b^3+bc^2$
(3) $6x^2+13xy+6y^2$ (4) x^3-5x^2+9x-9
(5) $a^2+3ac-4b^2-6bc$ (6) $x^3-ax^2-a^2x+a^3$
(7) $x^4-2a^2x^2+a^4$ (8) $8a^2b^2-4ab^3-12b^4$
(9) $a^2+2ab+b^2$
(10) $4a^2+4b^2+4c^2+8ab+8ac+8bc$
(11) $x^2+y^2+z^2+2xy+2xz+2yz$
(12) $\frac{9}{4}a^2+3a^2b+3ab^2+b^3$ (13) $a^2-b^2+2bc-c^2$
(14) $36a^2-30ab-36b^2$
(15) $-6a^5b^2-12a^4b^3c^2+a^3b^3+2a^2b^3c^2$
(16) $10x^3y^3-8x^2y^3z$.

EXERCISE XI. Page 77.

(1) $a^2-2ab+b^2$ (2) $m^2+2mn+n^2$
(3) $y^2-2yz+z^2$ (4) m^2-n^2
(5) a^2+4a+4 (6) $9a^2+12ab+4b^2$
(7) a^2-b^2 (8) x^2-1.

EXERCISE XII. Page 90.

(1) $\frac{m}{n}$; $\frac{pq}{rs}$; $\frac{x}{y}$ (2) $\frac{abc}{def}$; $\frac{pqr}{xyz}$
(3) x^4; a^3; a^2b (4) a^2b; mn^5
(5) 1; 1; 1 (6) $12abc$; $-9x^2y$
(7) $6003ab^2c$ (8) $112ac^2$
(9) $\frac{x}{y}$ pounds (10) 60

EXERCISE XIII. Page 91.

(1) $x+y+z$ (2) $b-4a+6ab$
(3) $-ax+5a^2-2ax^2+3$ (4) $\frac{1}{2}a^2-\frac{3}{8}ax+\frac{5}{8}x^2-\frac{5}{12}ax^2$
(5) $12x^2y^2-5xy^2z+6y^3z^2$ (6) 1 : −3
(7) $a+b$ (8) $a-b$
(9) x^2-3xy (10) $3x-4y$
(11) $3x-2y$ (12) $x+5$
(13) $a^2-8a-20$
(14) $8x^3+12x^2y+18xy^2+27y^3$
(15) $a^4+2a^3+3a^2+4a+5$
(16) $1+5x+15x^2+45x^3+$ etc.

ANSWERS TO ARITHMETIC.

MARCH.

STANDARD III.

A. 1. 189—7
2. 202—11
3. 2174—7

B. 1. 2414—10
2. 14,948—28
3. 37,091—36

C. 1. 8389—28
2. £931 5s. 4½d.
3. £4374 3s. 10½.

D. 1. £642 15s.
2. 8479—430
3. 248—1664

E. 1. £1153 6s. 1c⅓.
2. £8516 17s. 10¼d.
3. 1,030,554

F. 1. 3,122,966 f.
2. £223 14s.
3. 21,734—843

Advanced Examination.

1. £596,431 0s. 3½d.
2. 1s. 1d.
3. £168 15s.

STANDARD IV.

A. 1. £879 16s. 1½d.
2. £44,076 18s. 7½d.
3. £510 17s. 3½d.—6

B. 1. £598,228 16s. 9d.
2. £289,115 12s. 6d.
3. 188,160 cz.

C. 1. 209 tons. 5 cwt. 1 qr. 2 lb.
2. 588,060 sq. ft.
3. £1 2s. 6d.

D 1. £425,766 19s. 7½d.
2. 12s. 0¾d.
3. £428 19s. 0¾d.—102

E. 1. 714 days 14 hrs. 25 mins. 39 secs.
2. 486,000 secs.
3. £11 11s. 3½d.—2694

F. 1. 87 tons 4 cwt. 0 qrs. 12 lbs. 3 ozs. 2 drs.
2. 200.750 bricks
3. 569,204 yds. 0 qr. 2 nls. 1¼ ins.

Advanced Examination.

1. £16 17s. 6d gain
2. 4½ hrs.
3. £487 10s.

STANDARD V.

A. 1. £8 10s. 0½d.
2. £22 8s. 0¾d.
3. £478 10s. 1½d.

B. 1. £166 2s. 1d.
2. £112 1s. 3d.
3. £1374 16s. 1½d.

C. 1. £8635 6s. 3d.
2. £16,711 5s. 0½d.
3. £33,779 12s. 8d.

D. 1. £87 0s. 9d.
2. £8 7s. 5½d.
3. £331 8s. 6⅝d.

E. 1. £52 10s. 0⅓d.
2. £80 17s. 2½d.
3. £4 16s. 4$\frac{8}{17}$d.

F. 1. 31½
2. 3$\frac{3}{4}$ days
3. £1 17s. 4½d.

Advanced Examination.

1. £14,373 8s. 9d.
2. £3 10s., £7, £10 10s., and £21
3. £149 0s. 1$\frac{8}{24}$d.

STANDARD VI.

A. 1. 2$\frac{19}{24}$
2. 1$\frac{13}{20}$
3. $\frac{84}{277}$

B. 1. 71·9075
2. 76 7
3. ·159375

C. 1. 200 shirts
2. 20 days
3. 189 ton

D. 1. 25$\frac{91}{180}$
2. £28,586 13s. 4d.
3. 5$\frac{73}{134}$

E. 1. £32 1s. 9d.
2. £268 2s. 6$\frac{13}{23}$d.
3. 74·503606

F. 1. 3$\frac{127}{140}$
2. $\frac{811}{8400}$
3. £23 2s. 10$\frac{3}{4}$d.

Advanced Examination.

1. 2$\frac{88}{6666}$
2. 7s.—0·19572d.
3. 14,000 lbs.

STANDARD VII.

A. 1. 234
2. £201 6s. 5$\frac{1}{10}$d.
3. £365 5s. 7$\frac{377}{420}$d.

B. 1. 11 years
2. 4078
3. 3 per cent.

C. 1. £1 18s. 4$\frac{2929}{4320}$d.
2. £357 2s. 10$\frac{3}{7}$d.
3. 23

D. 1. 33$\frac{1}{3}$, 25, 20 years
2. 17$\frac{117}{140}$ days
3. £1600

E. 1. ·0000171875
2. £2075 18s. 9$\frac{15}{16}$d.
3. 4½ per cent.

F. 1. £548 16s. 10$\frac{9}{14}$d.
2. £180
3. 1.514,002 min.

Advanced Examination.

1. £2281 15s. 11$\frac{1}{73}$d.
2. £3 8s. 4$\frac{20}{49}$d.
3. 466·689, 155·563 yards

APRIL.

STANDARD III.

A. 1. 2,853,615—12
2. 20,369—4
3. 1085—165

B. 1. 10,903—71
2. 7889—8864
3. £4532 11s. 7$\frac{3}{4}$d.

C. 1. £79,824 15s. 3¼d.
2. 4796—68471
3. £599 18s. 9½d.

D. 1. 62—64,634
2. £32 11s. 9d.
3. One million and one

E. 1. 7,709,772
2. £2 17s. 11d.
3. £1873 12s. 6d.

F. 1. 133 rem.
2. £464 13s. 11¾d.
3. 884—1933

Advanced Examination.

1. £3585 6s. 4d.
2. 39 oranges
3. £1 2s. 1d. (lamb)

STANDARD IV.

A. 1. £21,918 7s. 2½d.
2. £82,387 9s. 3d.
3. £232 8s. 9½d.

B. 1. £9527 12s. 3¾d.
2. £1110 10s. 9½d.
3. 31,536,000 secs.

C. 1. £448 16s. 2¾d.—136.
2. 2489084d.
251 tons 8 cwt. 1 qr. 24 lbs. 6ozs.

D. 1 £156 5s.
2. 13s. 11½d.—72641
3. 3,722,400 inches

E. 1. £8145 9s. 11½d.
2. £6048
3. July 2nd

F. 1. 360,547,840 dr.
2. 2294 books
3. 69,696,000 sq. feet

Advanced Examination.

1. 1160 oranges
2. £486
3. £4,570,860 12s

STANDARD V.

A. 1. £174 2s. 7½d.
2. £290 19s. 11½d.
3. £864 12s. 2½d.
B. 1. £14,048 4s. 0⅜d.
2. £6549 16s. 3⅜d.
3. £244,655 18s. 6½ l.
C. 1. £7697 6s
2. £49,734 15s. 3½ l.
3. £157,785 17s. 9½d.
D. 1. £16 16s. 6⅛d.
2. £28 8s. 8⅛d.
3. 189 oranges

E. 1. £4523 9s. 1⅓d.
2. £590 0s. 3⅜ l.
3. 18 additional men
F. 1. 550
2. £189 4s. 1⅓d.
3. £115.

Advanced Examination.

1. £19 12s. 3½d.
2. 22s. 6d., 11s. 3d, 3s. 9d.
3. £43 8s. 2⅛d.

STANDARD VI.

A. 1. 8⅓
2. 17s. 8½d.
3. $\frac{7}{785}$ G.
B. 1. 4619·73
2. ·00024600375
3. £1 7s. 7$\frac{42}{71}$d.

C. 1. 8⅜ hours
2. 420 mice
3. £3 17s. 7$\frac{33}{50}$d.
D. 1. $\frac{1}{18}\frac{17}{18}$
2. ·00100075
3. 1458⅓ loaves

E. 1. £3 16s. 1½d.
2. 5⅛ hours
3. ·008763
F. 1. $\frac{6}{25}$
2. $\frac{17}{5000}$ G.
3. $\frac{675}{1984}$ cwt.

Advanced Examination

1. £43 4s.
2. $\frac{67}{1071}\frac{25}{250}\frac{473}{000}$ or ·814232 +
3. 11$\frac{1}{17}$ hours

STANDARD VII.

A. 1. $\frac{24}{96}\frac{31}{000}$ half cr.
2 £108 18s. 9d.
3. 3$\frac{7}{11}$ per cent.
B. 1. 33 marbles
2. £895 14s. 3$\frac{3}{7}$d.
3. 2$\frac{80}{1005}$ years
C. 1. 5206
2. 5$\frac{283}{3000}$ per cent.
3. 14$\frac{2}{3}$ per cent.
D. 1. £550 16s. 11$\frac{33}{50}$d.
2. £561 9s. 10$\frac{30}{50}\frac{04}{6}$d.
3. 265

E. 1. £10 19s. 0$\frac{3}{4}$d.
2. 6$\frac{15}{60}$d. a lb.
3. July 22, at 8.13 p.m.
F. 1. £13 8s. 4·992d.
2. £148 12s. 6·2976d.
3. £80,000 (ship)

Advanced Examination.

1. 8 and 40 hours
2. £216; 5⅝ per cent.
3. 31$\frac{3}{7}$ per cent.

MAY.

STANDARD III.

A. 1. 16,980—3
2. 22,263—23
3. 6923—606
B. 1. 1084—78
2. 16,628—62
3. 404—715
C. 1. 25,165,824
2. £3906 12s. 6½d.
3. £66,259 12s. 4d.
D. 1. £30 2s.
2. 130—21,210
3. £11 15s. 1½d.

E. 1. £939 5s. 8⅔d.
2. 770,574
3. £128 7s. 3d.
F. 1. 412—55,560
2. £54,166 13s. 4d.
3. £31 2s. 6d. gain

Advanced Examination.

1. £1 16s. 8d. gain
2. £6,930,993 19s. 9⅔d.
3. £17 2s. 9d.

STANDARD IV.

A. 1. £10,942 5s.
2. £49,757 4s. 0⅜d.
3. £5120 2s. 3⅜d.—5
B. 1. £2901 18s. 0⅜d.
2. £61 13s. 7½d.—29
3. 79 coats, and 1 yd. 2 qr. 1 nl. left
C. 1. 104d. 8h. 26m. 55s.
2. £66 0s. 1$\frac{0}{4}$d.—24,884
3. 29 gross of needles.
D. 1. 223 ton, 14 cwt. 3 qr. 23 lb. 5 oz.
2. 646,719$\frac{3}{4}$ sq. ft.
3. £546,057 3s. 6$\frac{3}{4}$d.

E. 1. 209,952 c. in.
2. 8s. 6$\frac{1}{4}$d.
3. 13s. 7½d.—29,710
F. 1. 3 ton 12 lb.
2. 15,488d. 4h. 37m. 39s.
3. 1,212,960 beans

Advanced Examination.

1. 2760 oranges
2. £12 7s. 6d. each ox
3. 153 caps

STANDARD V.

A. 1. £28 7s. 9$\frac{3}{4}$d.
2. £641 0s. 7½d.
3. £2877 1s. 8¼d.
B. 1. £3342 4s. 8½d.
2. £8437 18s. 5¼d.
3. £7219 14s. 0½d.

C. 1. £41,250 4s. 3d.
2. £255,684 17s. 5d.
3. £58,654 6s. 3d.
D. 1. £394 15s. 8⅞d.
2. £8032
3. £599 3s. 8$\frac{11}{20}$d.

E. 1. £5,201,857 11s. 6$\frac{3}{4}$d.
2. £3378 18s. 1½d.
3. £1437 3s. 2$\frac{5}{6}$d.
F. 1. 90
2. £64 11s. 3d.
3. £87 0s. 4½d.

Advanced Examination.

1. £7 11s. 11¼d.
2. £167 6s. 10½d.
3. 8s. 9d. m., 6s. 3d. w., 2s. 6d. b.

STANDARD VI.

A. 1. 3$\frac{45}{170}$
2. 4$\frac{41}{60}$
3. $\frac{2}{77}$
B. 1. ·61875
2. 2000
3. 4s. 1$\frac{7}{12}$d.
C. 1. 31$\frac{47}{85}$ acres
2. 3$\frac{58}{99}$ hours
3. 6$\frac{13}{18}$ hours
D. 1. 2$\frac{0}{6}\frac{0}{3}\frac{5}{6}$
2. $\frac{4}{15}\frac{2}{9}\frac{3}{76}$
3. £1214 3s. 8$\frac{4}{25}$d.

E. 1. £7 16s. 8$\frac{3}{4}$d.
2. 741$\frac{15}{17}$ oz.
3. 281¼ yds.
F. 1. ·063
2. ·01103+
3. 68 to 75 (A to B)

Advanced Examination.

1. 5 to 4
2. 29$\frac{11}{22}\frac{8}{75}$
3. £166 4s. 8·808d. (gain)

STANDARD VII.

A. 1. £1 2s. 1$\frac{23}{61}\frac{3}{4}$d.
2. £126 19s. 10½d.
3. 2$\frac{10}{20}\frac{4}{3}$ per cent.
B. 1. 1,025,750 min.
2. ·0008701+
3. £6 10s. 7$\frac{17}{30}$d.
C. 1. 3$\frac{40}{110}\frac{3}{0}$ years
2. 7500 persons
3. £3716 8s.
D. 1. £2272 14s. 6$\frac{6}{11}$d.
2. £4350
3. £149 9s. 6·127872d.

E. 1. £38$\frac{7}{11}$
2. £6 11s. 2$\frac{10}{11}$d.
3. £100 17s. 7$\frac{1}{6}$d.
F. 1. 63·25
2. 3·75
3. 85$\frac{5}{27}$ per cent.

Advanced Examination

1. 53$\frac{19}{37}$m. past 12
2. £6690 14s. 3$\frac{1}{10}$d.
3. 235·339+yards

JUNE.

STANDARD III.

A. 1. 37,722—11
2. 24,391—19
3. 13,357—322
B. 1. 230,436
2. 10,103—485
3. 810—171
C. 1. 26 994—44
2. £723 14s. 4½d.
3. £26,644 11s. 7d.
D. 1. £613 11s. 4½d.
2. 585,491 farthings
3. 1692 boys

E. 1. 17,000 marbles
2. £62 4s. 7½d. less
3. 4100—4120
F. 1. 2049—20,166
2. £28,343 18s. 0½d.
3. £914 9s. 9d.

Advanced Examination.

1. Boy, 9½d., girl, 1s.
2. £292 5s. 10d.
3. £761 10s. 10½d.

STANDARD IV.

A. 1. £2061 1s. 6d.
2. £5908 8s. 3½d.
3. £294 5s. 5½d.
B. 1. £28,410 4s. 4½d.
2. £129 15s. 11½d.—49
3. 176,391 lbs.
C. 1. 2½d.—43,118
2. 139 tons 16 cwt. 3 qrs. 14 lbs. 14 ozs.
3. £2 5s. 2½d.
D. 1. 111 wks. 14 h. 5 m. 17 secs.
2. 96 weeks.
3. £7 4s. 1d.

E. 1. 564,537,600 sq. ft.
2. 212 dresses, 3 yds. 1 qr. left.
3. £5677 17s. 5½d.
F. 1. 256,015 mins.
2. £872 2s.
3. 255,636 inches

Advanced Examination.

1. 342 ton 3 cwt. 3 qrs.
2. 14 lbs.
3. 84½ lbs.

STANDARD V.

A. 1. £4 5s. 10½d.
2. £50 9s. 4½d.
3. £166 18s. 9¾d.

B. 1. £298 1s. 8d.
2. £4937 2s. 3¾d.
3. £1891 13s. 6½d.
C. 1. £13,784 10s. 2½d.
2. £39,910 7s. 3½d.
3. £90 18s. 7$\frac{7}{10}$d.
D. 1. £32 6s. 11$\frac{1}{8}$d.
2. £34 4s.
3. £1297 7s. 11d.
E. 1. £15 10s. 6½d.
2. £332 1s. 6¾d.
3. £331 12s. 2¼d.

F. 1. 2800 marbles
2. £24 0s. 9$\frac{6}{10}$d.
3. £27 7s. 10½d.

Advanced Examination.

1. £1712 10s. gain
2. £4213 8s. 8$\frac{81}{140}$d.
3. £48 7s. 10d.

STANDARD VI.

A. 1. 2$\frac{13}{14}$
2. 2$\frac{53}{72}$
3. 2$\frac{9}{17\frac{1}{5}}$
B. 1. 6s. 1$\frac{1}{3}$d.
2. 37·665
3. $\frac{31}{33}$
C. 1. £20 14s. 4$\frac{4}{5}$d.
2. £8 7s. 11d.
3. 14$\frac{53}{385}$
D. 1. £7 12s. 0·5472d.
2. 5 hrs. 8 mins.
3. ·497857142

E. 1. 3$\frac{44}{231}$
2. $\frac{847}{1000}$
3. £50 8s.
F. 1. 651·348
2. $\frac{1053}{1760}$ lbs.
3. £3 9s. 8$\frac{4}{15}$d.

Advanced Examination.

1. 19$\frac{1}{13}$ hours
2. £1 5s. 6d. ·6525
3. 9$\frac{102}{185}$ days

STANDARD VII.

A. 1. £117
2. £89 13s. 3d.
3. 2$\frac{1}{17}$ per cent.
B. 1. £7 2s. 7$\frac{85}{93}$d.
2. 2$\frac{7}{11}$ years
3. £357 2s. 10½d.
C. 1. 143$\frac{7}{51}$ days
2. 3$\frac{89}{117}$ per cent.
3. Man to boy as 85 to 63
D. 1. £427 18s. 8$\frac{8}{13}$d.
2. £189 12s. 10$\frac{23}{35}$d.
3. 177·369+yards.

E. 1. May 19th, at 3-46 a.m.
2. £20 14s. 7$\frac{2}{11}$d.
3. 7$\frac{7}{17}$d.
F. 1. £600
2. £843 12s. 11$\frac{1}{13}$d.
3. £83 17s. 11$\frac{888}{1849}$d.

Advanced Examination.

1. 14s. 8½d. a yard.
2. 5$\frac{1}{15}$ per cent.
3. £141 7s. 10½d.

JULY.

STANDARD III.

A. 1. 41,212—7
2. 26,817—20
3. 2,993,088—40
B. 1. 93,964—417
2. 889—18386
3. 67—4908
C. 1. £199 16s. 7½d.
2. £714 13s. 9½d.
3. £162,455 2s. 9¾d.
D. 1. 652,546 farthings
2. 34,212 apples
3. 7,608

E. 1. 651 slates
2. £466 13s. 4d.
3. 582—41,963
F. 1. £9,462 11s. 6½d.
2. 14,498,894
3. 77—897,170

Advanced Examination.

1. 6989,378,011 farthings
2. 252 tons
3. £300

STANDARD IV.

A. 1. £19,218 7s. 2½d.
2. £60,980 5s. 2½d.
3. £264 19s. 10$\frac{3}{8}$d.—18
B. 1. £44,719 6s. 9$\frac{3}{4}$d.
2. 1,02 ,440 oz.
3. £26 14s. 1$\frac{1}{4}$d.—41
C. 1. 2279 t. 14 c. 3 qr. 24 lb. 7 oz.
2. £259 8s. 6½d.
3. 1s. 6½d.—467,920
D. 1. 2s. 2½d.
2. 505,108,100 sec.
3. 3 2 shirts, and 2 yd. 3 qr. 2 nl. lef

E. 1. £67 19s.
2. £661,245 18s. 9d.
3. £151 5s.
F. 1. £81 14s. 8$\frac{9}{4}$d.—2505
2. 5,487 lb. 4 oz. 15 dwt. 8 gr.
3. 301 ton 12 cwt. 2 qr. 9 lb.

Advanced Examination.

1. 42$\frac{1}{8}$ min. past 7
2. £60 19s. 6d. gain
3. 8 ton 9 cwt. 21 lb. 12 oz 9 dr.—4663

STANDARD V.

A. 1. £81 17s. $3\frac{1}{2}$d.
2. £150 11s. $2\frac{1}{2}$d.
3. £357 17s. $9\frac{3}{4}$d.
P. 1. £346 14s. $7\frac{1}{2}$d.
2. £7,550 3s. $1\frac{1}{2}$d.
3. £5 6s. $9\frac{1}{2}$d.
C. 1. £6,988 5s. $6\frac{1}{2}$d.
2. £72,211 17s. $2\frac{1}{2}$d.
3. £6 3s. $8\frac{1}{2}$d.
D. 1. 220 horses
2. £37,339 2s. $5\frac{1}{4}$d.
3. £268 17s.

STANDARD VI.

A. 1. $12\frac{7}{19}$
2. $\frac{3}{5}$
3. ·03359375
B. 1. $\frac{24}{45}$
2. ·00502
3. £2 19s. $10\frac{10}{33}$d.

E. 1. £4577 15s. $8\frac{4}{5}$l.
2. 169
3. £63 15s. 9d.
F. 1. £117 12s. $7\frac{1}{2}$l.
2. £135 8s. 4d.
3. £84 1s. $0\frac{1}{4}$d.

Advanced Examination.

1. £61 0s. $11\frac{338}{385}$l.
2. $37\frac{1}{2}$ lb. each cheese
3. £61 4s.

C. 1. $11\frac{1}{4}\frac{2}{4}\frac{3}{0}\frac{3}{0}$
2. £11 9s. $9\frac{1}{5}$d.
3. $1\frac{1}{11}$
D. 1. £39 1s. 3d.
2. 7·7758+
3. $\frac{10}{5}\frac{0}{0}\frac{0}{5}$

E. 1. £20 11s. 8l.
2. ·000001875
3. 8 hr. 6 min.
F. 1. $5\frac{5}{11}$ days
2. £294 12s. $1\frac{3}{5}$l.
3. £1 5s. $7\frac{9}{13}$d.

Advanced Examination.

1. $112\frac{6}{11}\frac{6}{3}$
2. £28 1s. 6·1632d.
3. £44 8s. $10\frac{3}{8}$d.

STANDARD VII.

A. 1. £73 2s. 6d.
2. $4\frac{1}{11}$ per cent.
3. $3\frac{3}{5}$ years
B. 1. $7\frac{1}{4}$ per cent.
2. £1010
3. $1\frac{3}{8}$ per cent. loss
C. 1. £12,675
2. $3\frac{39}{47}$ per cent.
3. £5025 12s. 6d.
D. 1. £28 16s. $6\frac{3}{8}$d.
2. £1059 4s. $8\frac{8}{15}$d.
3. $4\frac{8}{33}$ per cent.

E. 1. £185 6s. 8·49l.
2. £2 13s. $2\frac{11}{21}$d.
3. £625
F. 1. £743 17s. $8\frac{1}{33}$d.
2. £8 12s. $6\frac{3}{8}$d.
3. £2 17s. $0\frac{3}{8}$d.

Advanced Examination.

1. 529296·768 pop., and 32·324192 p. cent.
2. $84\frac{11}{30}$ per cent.
3. $131\frac{33}{167}$ days

AUGUST.

STANDARD III.

A. 1. 568—8
2. 607—10
3. 6522—21
B. 1. 804—68
2. 4982—102
3. 12,363—180
C. 1. 4194—68
2. £3816 12s. $3\frac{3}{4}$d.
3. £4377 8s. 10l.
D. 1. £672 15s.
2. 4239—1277
3. 124—1664

STANDARD IV.

A. 1. £798 1s.
2. £26,285 0s. $3\frac{3}{4}$l.
3. £612 10s. $6\frac{1}{4}$d.
B 1. £84,262 14s.
2. £273,563 15s.
3. 601,920 inches
C. 1. 188 ton 6 cwt. 2 qr. 27 lb.
2. 43,197 sq. yards
3. £78 15s.
D 1. £24,797 18s. $11\frac{1}{2}$d.
2. £428 19s. $0\frac{1}{2}$d.—204
3. £1 8s. 6d.

STANDARD V.

A. 1. £12 13s. $5\frac{1}{2}$d.
2. £44 3s. $2\frac{3}{4}$d.
3. £85 3s. $5\frac{1}{4}$d.
B. 1. £127 1s. $10\frac{1}{2}$d.
2. £347 4s. $10\frac{5}{2}$d.
3. £1220 10s. $6\frac{3}{4}$d.

E. 1. £2306 13s. $8\frac{1}{2}$d.
2. £8517 2s. $0\frac{3}{4}$d.
3. 2,061,108 twopences
F. 1. 4,860,734 farthings
2. £3973 8s.
3. 2477—110

Advanced Examination.

1. £187 10s.
2. 8 pears
3. 615,176,443 farthings

E. 1. 555,060 seconds
2. 83d. 3h. 38m. 15s.
3. 17s. $1\frac{1}{2}$d.—1399
F. 1. 249 cwt. 3 qr. 15 lb. 9 oz. 15 dr.
2. 150 doz.
3. 16,833 lb. 7 oz. 3 dwt. 23 gr.

Advanced Examination.

1. 2 ton 20 lb.
2. £25
3. 356 dresses, $5\frac{1}{2}$ yds. left

C. 1. £7285 9s. $8\frac{1}{2}$l.
2. £33,907 19s. 2l.
3. £82 5s. $1\frac{1}{4}\frac{2}{0}$d.
D. 1. £13 2s. 6d.
2. £953,940 0s. $4\frac{1}{2}$d.
3. £881 19s. $0\frac{7}{10}$d.

E. 1. £10 5s. $6\frac{1}{2}$d.
2. £33 5s. $1\frac{7}{8}$d.
3. £4640 12s. 6l.
F. 1. £2 1s. $5\frac{1}{4}$d.
2. £27 12s. $6\frac{1}{2}$l.
3. £12,590 8s. $6\frac{3}{4}$d.

Advanced Examination.

1. £5371 15s.
2. £1 5s.
3. £6981 2s. $7\frac{1}{2}\frac{1}{5}$d.

STANDARD VI.

A. 1. $3\frac{7}{24}$
2. $3\frac{4}{15}$
3. $\frac{4}{4}\frac{4}{0}\frac{5}{0}$
B. 1. 2·88725
2. ·01606
3. ·066875.
C. 1. $4\frac{3}{4}$ days
2. £6 17s. 6d.
3. 4s. $9\frac{9}{10}$d.
D. 1. $24\frac{3}{0}\frac{1}{0}$
2. £80 18s. 9d.
3. $4\frac{2}{4}\frac{1}{0}$

E. 1. £16 19s. $6\frac{8}{25}$d
2. £51 14s. $6\frac{2}{25}$d.
3. ·000005078125
F. 1. $\frac{3}{8}\frac{0}{5}\frac{1}{8}\frac{3}{0}$
2. $\frac{2}{6}\frac{3}{0}\frac{0}{0}$
3. £1 10s.

Advanced Examination.

1. $45\frac{3}{5}$ days
2. $10\frac{5}{1}\frac{5}{8}\frac{5}{0}$ hours
3. $\frac{6}{6}\frac{5}{4}\frac{8}{0}\frac{0}{0}\frac{1}{4}$

STANDARD VII.

A. 1. £284
2. £101 14s. $3\frac{3}{5}$d.
3. $3\frac{1}{1}\frac{1}{3}$ per cent.
B. 1. 327
2. £4 4s. $9\frac{3}{4}\frac{3}{0}\frac{0}{0}$d.
3. $4\frac{2}{3}\frac{0}{1}$ years
C. 1. £148 1s. $6\frac{3}{4}$d.
2. £135 19s. $0\frac{3}{8}$d.
3. £869 16s. 8l.
D. 1. £377 15s. $6\frac{3}{5}$l.
2. 649
3. £27 6s. $4\frac{1}{2}$d.

E. 1. $29\frac{1}{6}\frac{3}{0}$ per cent.
2. £6766 13s. 4d.
3. £7 5s. $7\frac{9}{1}\frac{9}{0}$d.
F. 1. $9\frac{2}{5}\frac{5}{4}\frac{1}{8}$ days.
2. £10 3s. $4\frac{1}{2}\frac{2}{0}\frac{1}{0}$d.
3. $14\frac{7}{6}$ loss

Advanced Examination.

1. 150 scholars
2. £25 1s. $11\frac{1}{1}\frac{1}{8}$d. increase
3. 179·067+yards

SEPTEMBER.

STANDARD III.

A. 1. 3,717,398—7
2. 442,436—8
3. 2170—330
B. 1. 6942—76
2. 83,008—929
3. £3317 5s. 6½d.
C. 1. £84,379 5s. 4 l.
2. 6558—28,850
3. £499 2s. 1½d.
D. 1. 223—37,659
2. £29 3s. 9d.
3. £136 16s.
E 1. 7,204,134
2. £14 11s. 1d.
3. £1854 18s. 4d.
F. 1. 136 rem.
2. £542 5s. 5¾d.
3. 1304—65,586

Advanced Examination.

1. £33 6s. 8d.
2. £3 19s. 1½d. saddle; £1 6s. 4½d. bridle
3. £1 6s. 1½d.

STANDARD IV.

A. 1. £34,082 9s. 0¾d.
2. £75,825 2s.
3. £452 6s. 10⅜d.—15
B. 1. £12,894 17s. 9d.
2. £83 17s. 9⅜d.—202
3. 13,408,500 sec.
C. 1. £84 11s. 7¾d.—8971
2. 29,395,275 farth.
3. 223 tons 10 cwt. 3 qrs. 27 lb. 1 oz
D. 1. 245,025 sq. ft.
3. 15s. 5⅝d.—42,257
3. 617,760 inches
E. 1. £3457 19s. 9d.
2. 200,375 grains
3. 216 tons 8 cwt. 2 qrs. 15 lbs.
F. 1. 429,906,432 dr.
2. 2212 books
3. 4014,489,600 inches

Advanced Examination.

1. £25 0s. 6d. gain
2. 7½d. an hour
3. Sept. 23rd, at 1.14 a.m.

STANDARD V.

A. 1. £580 8s. 10½d.
2. £668 11s. 5½d.
3. £3294 12s. 2½d.
B 1. £689 15s. 3⅜d.
2. £2058 9s. 11½d.
3. £7825 17s. 2¾d.
C. 1. £2751 10s. 6½d.
2. £5643 18s. 6¾d.
3. £113,763 8s. 10½d.
D. 1. £4 13s. 2⅝d.
2. £4805 13s. 10$\frac{5}{6}$d.
3. £11 3s. 9½d.
F. 1. £9. 7 16s. 6½d
2. £20 0s. 8 l.
3. 143½ lb.
F. 1. £36 1s. 5⅜d.
2. £261 14s. 4½ l.
3. £564 15s. 8¾d.

Advanced Examination.

1. 7s. 6d. each girl
2. £30 12s. 9d.
3. 20 days

STANDARD VI.

A. 1. 3$\frac{8}{15}$
2. ⅘
3. 9$\frac{1}{16}$
B. 1. 2·3705
2. 22·455
3. 3s. 10$\frac{1}{10}$d.
C. 1. 105$\frac{1}{35}$ shirts
2. $\frac{3}{4}$
3. 2s. 7$\frac{1}{10}$d.
D. 1. 6$\frac{3}{8}$ days
2. $\frac{8}{15}\frac{8}{16}\frac{8}{17}$
3. 3914·45625
E. 1. £28 11s. 6$\frac{8}{107}\frac{8}{108}$d.
2. 19s. 1$\frac{3}{16}\frac{7}{16}$d.
3. £9 14s. 0$\frac{3}{4}$d.
F. 1. $\frac{3}{4}\frac{5}{5}$
2. £9 13s. 11$\frac{7}{11}$d.
3. £59 5s. 2$\frac{8}{9}$d.

Advanced Examination.

1. 11$\frac{1}{9}$ days
2. £175
3. 1$\frac{4}{15}\frac{6}{16}\frac{1}{17}$ cwt.

STANDARD VII.

A. 1. £118 2s. 10½d.
2. 5$\frac{5}{8}$ per cent.
3. 3s. 9d. in the £
B. 1. £575 5s.
2. 6$\frac{5}{17}$ per cent.
3. £60 19s. 0¾d.
C. 1. £215
2. 8s. 0$\frac{3}{4}$d.
3. 4$\frac{1}{15}$ p. c. average
D. 1. £3133 6s. 8d.
2. £90 10s. 6·336d.
3. 3·38 per cent.
E. 1. £1 1s. 11$\frac{1}{11}\frac{7}{11}$d.
2. £5025
3. 3s. 10$\frac{1}{2}$d. each lat
F. 1. £787 10s.
2. £25 18s. 6$\frac{2}{9}$d.
3. 5$\frac{7}{31}$ years

Advanced Examination.

1. £4 14s. 10$\frac{4}{5}\frac{3}{0}$d.
2. £1583 13s. 0$\frac{1}{2}\frac{2}{3}$d.
3. £30 11s. 9$\frac{5}{17}$d.

OCTOBER.

STANDARD III.

A. 1. 4808—7
2. 19,545—34
3. 293—49
B. 1. 51,312—57
2. £39 2s. 9½ l.
3. 23,729 pence
C. 1. £9160 1s. 10½d.
2. 831—359
3. £599 19s. 8$\frac{3}{5}$d.
D. 1. 56—841
2. £643 11s. 6$\frac{3}{5}$d.
3. 2826 stamps
E. 1. £1 13s. 4d.
2. 75—5190
3. £10,220 12s. 3d.
F. 1. £816 2s. 11$\frac{3}{4}$d.
2. £5 8s. 8$\frac{2}{3}$d. less
3. 485 ducks

Advanced Examination.

1. 60 miles
2. £8 15s.
3. £5607 13s 8$\frac{3}{4}$d.

STANDARD IV.

A. 1. £811 2s. 0½d.
2. £7171 13s. 10½d.
3. £882 13s. 8$\frac{3}{4}$d.—6
B. 1. £850 4s. 7$\frac{3}{5}$d.
2. 166,656 ozs.
3. £5922 10s. 0$\frac{3}{4}$d.
C. 1. £3 3s. 9$\frac{3}{4}$d.—137
2. 60 shirts and 1 yd. 1 qr. left
3. 141 lb. 11 oz. 8 dwt. 3 gr.
D. 1. 132 boys
2. £1 13s 6½d.
3. 5$\frac{1}{4}$d.—2491
E. 1. £18 15s. 9d.
2. £55 6s. 3d.
3. 198 yd. 3 qr. 2 n.l. 1$\frac{1}{2}$ in.
F. 1. 54,722$\frac{1}{2}$ sq. ft.
2. 1080 eggs
3. 20,939,520 oz.

Advanced Examination.

1. £785 8s. 4d.
2. 2$\frac{1}{4}$ days
3. 11$\frac{1}{2}$ lb. each horse

STANDARD V.

A. 1. £44 5s. 7½d.
2. £172 3s. 7½d.
3. £257 3s. 2¼d.
B. 1. £3 18s. 5¼d.
2. £732 14s. 0½d.
3. £2 3s. 9d.
C. 1. £3097 0s. 1¾d.
2. £73 0s. 0½d.
3. £19 5s. 6½d.
D. 1. £60,282 4s. 2d.
2. £18 17s. 9⅜d.
3. 114 balls
E. 1. £465 12s. 6d.
2. £113 6s. 10½d.
3. £26 14s. 11d.
F. 1. £43 17s. 6½.
2. £10 4s. 9½.
3. £53,840 13s. 0½d.

Advanced Examination.

1. £19 11s. 7¼d.
2. 24 yards
3. £206 9s. 2d. gain

STANDARD VI.

A. 1. $1\frac{13}{20}$
2. $\frac{13}{60}$
3. $7\frac{7}{24}$
B. 1. 12·29
2. ·05148
3. ·00109375
C. 1. 19s. 3d.
2. £2 3s. $9\frac{7}{25}$d.
3. $\frac{17}{60}$
D. 1. $2\frac{2}{10}\frac{1}{4}$
2. £·8260869+
3. 18 days
E. 1. $\frac{7}{75}$
2. $5\frac{95}{110}$d.
3. 44 to 43
F. 1. £1327 1s. 8d.
2. $\frac{21}{88}$
3. 12s. $10\frac{20}{31}$d.

Advanced Examination.

1. 64 to 25
2. £15 11s.
3. 1 5779+lb.

STANDARD VII.

A. 1. £15
2. £101 12s. 6½.
3. 6½ per cent.
B. 1. £845 4s. 4½d.
2. 15s. 3d.
3. $3\frac{17}{60}$ per cent.
C. 1. £8116 17s. 6½.
2. $6\frac{28}{51}$ per cent.
3. $2\frac{19}{17}\frac{4}{8}$ years
D. 1. £739 2s. $7\frac{7}{75}$d.
2. 2½ per cent.
3. £4 9s. 7½d. loss.
E. 1. $41\frac{7}{8}$ per cent.
2. £1 4s. $6\frac{1}{10}\frac{1}{8}$d. a cwt.
3. £127 7s. 10·5408d.
F. 1. £204 10s. $10\frac{1}{11}$d.
2. $14\frac{3}{4}$ p. c. additional
3. £79 14s. $8\frac{88}{101}$d. P.W

Advanced Examination.

1. £20 14s. $3\frac{3}{7}$d. increase
2. £35 16s. each horse
3. $5\frac{8}{8}\frac{8}{4}$ months

HUGHES'S
Examination Manuals for Teachers.

Set by H. M. I. of Schools.

EXAMINATION QUESTIONS.

The Head Master of a large London School, writes:—'Your "Handbook of Examination Questions" is simply invaluable.'

RE-ENLARGED EDITION.

HUGHES'S HANDBOOK of EXAMINATION QUESTIONS.

Extra cloth. Price Five Shillings.

Contains thousands of *bona-fide* School Examination Questions in Arithmetic, Geography, Grammar, and Analysis—acknowledged the best collection of Questions ever issued. The whole of the Unrivalled Series, with Answers, have just been added; also *Lewis's Answers to all Standards of Grammar and Geography Test Questions.*

The Canadian Educational Monthly says:—'Mr. Hughes's Handbook is one we can strongly commend to the teachers of our public schools. It contains an extensive assortment of questions in four of the most important subjects of their work. Many of these are selected from those put by Inspectors in Britain, when visiting schools, to test the knowledge of the classes they examined. The questions are graded so as to suit the various classes, from the first book up to the fourth or fifth. Answers are supplied to the Arithmetic questions. Amongst the easy problems for young thinkers will be found a large number that will serve admirably as exercises in mental Arithmetic. To teachers of ungraded schools, who have such variety of work to attend to, this book will be particularly valuable.'

Set by the Education Department.

HUGHES'S PUPIL TEACHERS' GRADUATED EXAMINATION QUESTIONS.

In consequence of the great success of the 'Handbook of Examination Questions,' and in response to numerous requests for a similar work for Pupil Teachers, Mr. HUGHES has pleasure in announcing the following Manuals, each of which consists of complete sets of Pupil Teachers' Examination Questions for five years.

The Questions are classified and graduated by W. J. DICKINSON.

	s.	d.
Male Arithmetical Questions, with Answers...	1	6
Wollman's Complete Key, with full working	4	0
Female Arithmetical Questions, with Answers	1	6
Wollman's Complete Key, with full working	8	0
Euclid, with all Deductions, arranged according to the Propositions (cloth edition, 1s)	0	4
Wollman's Complete Key, with full working	2	6
Algebra, with Answers	0	4
Atkins' Complete Key, with full working ...	2	6
Mensuration, with Answers	0	4
Atkins' Complete Key, with full working ...	0	6
Complete Mathematical Questions, with Answers	3	6
Grammar, Analysis, Parsing, Paraphrasing, Notes of Lessons and Composition	1	6
Bowden's Key to the Paraphrasing, Derivation, History of the Language, Parsing and Analysis	2	6

☞ This Manual contains the Answers to the finest collection of Examination Questions in Parsing and Analysis in the English Language.

Hughes's PUPIL TEACHER'S HANDY MATHEMATICAL and GRAMMATICAL QUESTION-BOOK, containing the whole of the above (except Keys)	5	0
Complete Key to Pupil Teachers' Question-Book (over 900 pp.)	7	6
Pupil Teachers' Question-Book and Key, bound together (over 1,200 pp.)	10	0

☞ This Manual is indispensable to Head Teachers in preparing and examining their Pupil Teachers' work. *** Specimen on receipt of 7s. 6d.

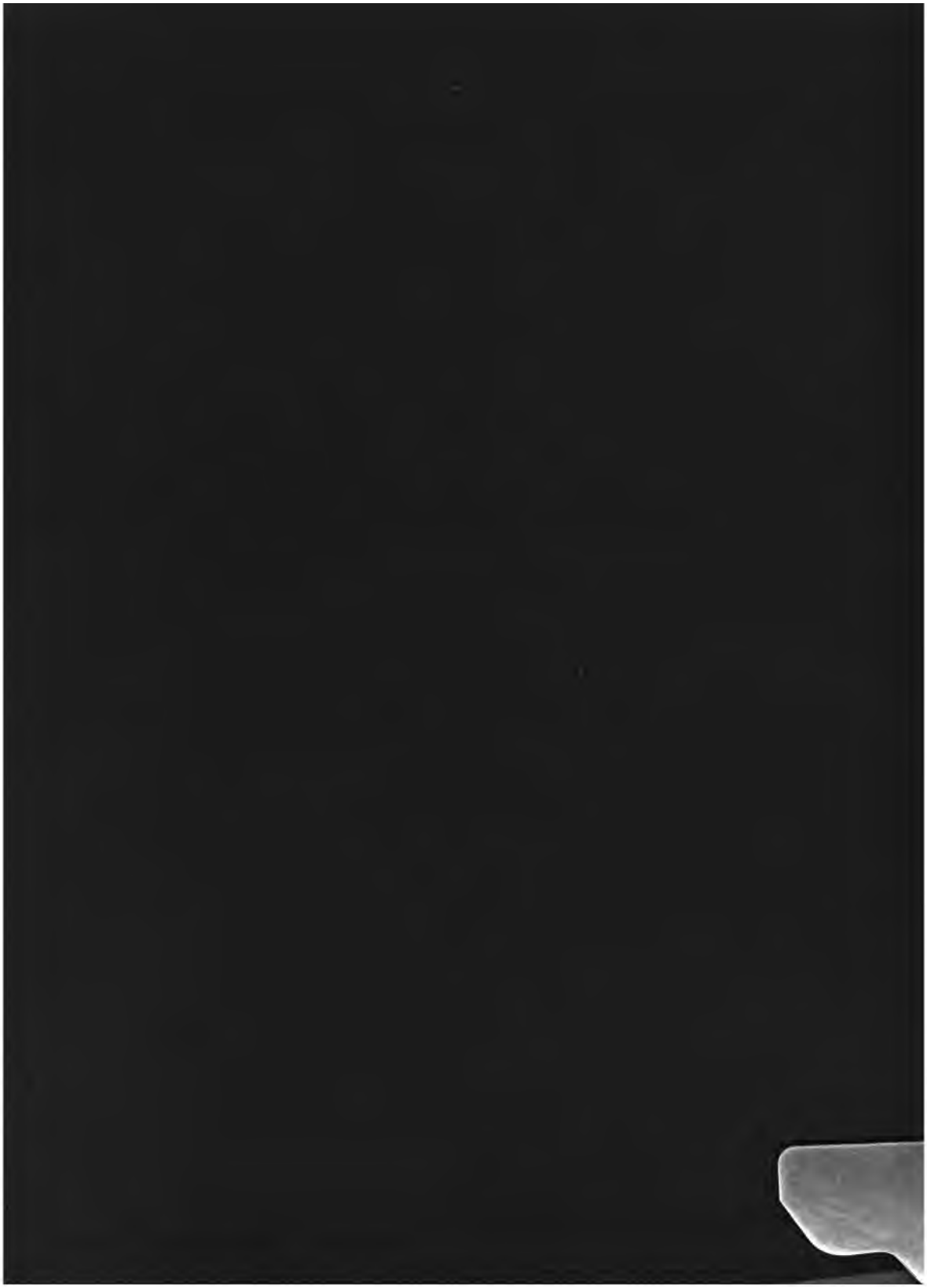
Set by Examiners of London University. Fcap. 8vo, 240 pp., price 3s. 6d.

THE QUESTIONS SET AT THE MATRICULATION EXAMINATION

OF THE LONDON UNIVERSITY, JUNE, 1880, WITH FULL MODEL ANSWERS.

BY W. P. WORKMAN.

First in Honours at the above Examination.

*** In addition to showing the kind of Answers which places a man at the top of the List, it contains all information necessary to Candidates, and also to those intending to graduate.

LONDON: JOSEPH HUGHES, PILGRIM STREET, LUDGATE HILL, E.C.